How Communities Can Use Statistics

Ten Quick Tips on Using Statistics for Communities

1) Check all possible sources and anticipate that some data you need may be difficult to find or not be available at all.

2) When using data covering two or more time periods for a particular community, be sure that data for each time period identify the same boundaries for the community.

3) Check to ensure that definitions and geographic coverage are similar between different data sources.

4) Statistics Canada's Census of Population and Housing is the best overall source of demographic data.

5) Data for areas within cities are usually available only from the Census of Population and Housing or from local municipal authorities.

6) Besides its statistical data, Statistics Canada can provide reference resources such as maps and descriptions of classification schemes.

7) There are some data that Statistics Canada *cannot provide for all urban areas.* These include:
   — retail trade data
   — comprehensive economic indicators equivalent to the gross national product
   — lists of all businesses in a city
   — annual income figures
   — seasonally adjusted data

8) Statistics Canada's data are released in numerous ways. These include publications which can be purchased or ordered through regional reference centres. These publications are also available for reference in major libraries.

9) A considerable quantity of geographically detailed data in addition to those regularly published can be obtained from Statistics Canada by special request.

10) The local planning department is usually the best alternative source of statistical information.

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Table of Contents

Introduction

This booklet describes how to find and apply information from Statistics Canada's vast collection of data. It is designed to serve the needs of individuals or groups concerned with community planning in one form or another. "Community", as used here, is broadly defined to include cities, towns and neighbourhoods. Intended readership includes citizen activists concerned with the community planning process as well as professional town planners and other civic administrators for whom statistically-based research may be an essential and regular part of their daily work.

The basic approach used is illustrative — using the experiences of a fictitious community to help explain how statistical data can be found and applied to problems typically faced by community planners or others who are active in community affairs. Chapter one provides an overview of the geographical organization and the availability of statistics. In each of chapters two to six, a case study approach is used to help explain applications of statistics or statistical techniques to particular types of problems commonly faced by communities.

The fictitious community of Facton, with its neighbouring community of Rapporto, is introduced in Chapter two to provide the setting for these case study illustrations. In order to ensure that examples are as realistic as possible, the data presented for these fictitious communities are based on actual data pertaining to existing communities. Some changes have been made to disguise the origins of these statistics without diminishing their value in providing realistic examples of the type of data that are available. The narratives describing groups, persons and events in Facton are purely fictitious.

Descriptions of methodological approaches and techniques presented in this booklet should not generally be taken as complete directions that can be followed to achieve good results in any circumstances. They are intended primarily to illustrate the type of thing that can be done and some of the problems that will have to be faced. There are many possible pitfalls to beware of when using statistics and every situation will call for a slightly different approach depending on the problems, research goals, availability of data and the expertise of the researchers. For many problems, such as conducting a sample survey or projecting population size, it will often be necessary to seek consultation from experts to ensure that results will be valid.

For further directions on how to locate and interpret statistical information, the reader is referred to another guide from Statistics Canada entitled *Finding and Using Statistics*. Additional references are listed in the following chapters to indicate where more detailed information can be found on specialized topics.

Finally, the data used for the examples presented here represent only a small part of what is available. It would not be possible to present the full range of data for communities in a booklet of this size. For those seeking consultation in selecting appropriate data, Statistics Canada operates reference centres located in cities across Canada. See page 72 for list with addresses and phone numbers.

Chapter 1
Statistics for Cities, Towns and Neighbourhoods — Availability of Data and How Areas are Identified

As the national statistical agency, Statistics Canada's primary responsibility is to provide statistics on Canada's overall social and economic fabric. Generally, this involves producing national and provincial figures on persons, households, businesses and so forth. It is also part of Statistics Canada's responsibility to produce statistics for smaller areas such as the more than five thousand cities, towns, townships and villages, and the neighbourhoods within these areas. For these smaller geographic areas within provinces, sometimes called 'sub-provincial' areas, Statistics Canada provides a great many data that are essential for discussion and decision-making on questions such as the adequacy of housing or where to locate new industrial plants. Also available are statistics for local areas collected by various other government and private organizations.

Availability

In an ideal system for producing statistics on small geographic areas, every person, dwelling or work site and all activities (crimes, accidents, trips, etc.) would be assigned a precise geographic identifier. This would be a code number identifying it as belonging to a distinct location separate from any other. Thus, whenever data for a defined geographic area were required, the appropriate up-to-date information about the people, sites and/or activities within this area could be retrieved. However, there is no such system currently in existence. The complexities and the very volume of information required for this type of system would probably be impossible to manage and the volume and detail of data it would provide would go beyond the requirements of most data users. However, even though the existing statistical system does not meet this ideal requirement, it nevertheless provides a great deal of valuable data for small geographic areas. Although not perfectly adequate for all purposes, the existing small area data available from Statistics Canada and other sources are sufficient to meet the most important needs of the majority of data users.

In general, the geographic availability of statistical information is dependent on several factors:

a. whether the data are collected — For instance, no major statistics gathering operation in Canada inquires whether people are left or right-handed. Consequently, data for this characteristic do not exist.

Many sample surveys are designed to provide data for larger geographic areas and cannot be disaggregated into smaller areas because the sample size becomes too small to be reliable. Because of varying priorities and resources, data are sometimes collected in one locale but not in another. The major determinant of which data are collected and which are not is the trade-off between cost and demand.

b. whether the data can be collected on a geographic basis — As an example, many corporate activities are not easily associated with a specific geographic location. Consequently, no comprehensive data exist on corporation financial activities for areas within Canada other than some limited provincial breakdowns.

c. what level of geographic detail was specified for the information when it was collected — Spatial detail available in tabulated data is limited to the geographic coding specifics that are used at the time of collection or recording. For instance, if a particular survey notes only the province of the event, then no sub-provincial tabulations can be made.

d. what confidentiality constraints exist — Almost all information-gathering organizations operate under certain disclosure rules. Statistics Canada cannot release any information that could be traced to an individual, organization or company. Thus, data may be collected for an area but, if there are a limited number of occurrences of the phenomena (say only one manufacturing plant), then Statistics Canada cannot release the manufacturing data for that area.

Classification of Areas for Statistical Purposes

A first prerequisite to providing statistical information on geographic areas is to describe the "areal system" used — the pattern of areas identified for statistical purposes. In other words, it is necessary to state explicitly the boundaries recognized in the spatial definitions of the data.

In general, three approaches are followed:

1. Utilize the existing structure of local government as defined by county boundaries, city limits, town lines, district borders, etc.
2. Follow spatial definitions established by administrative programs or government departments. An example is the postal code.
3. Create spatial definitions specifically for the purpose of compiling and releasing data — sometimes called "geostatistical areas".

Statistics Canada, as the major producer of statistical information across Canada directly utilizes the first and third methods and, when possible, provides a method of making the second approach compatible with the other two.

Table 1.1 lists all the geographic designations used by Statistics Canada as well as some of their basic features. The following are short definitions of these terms. Their full definitions and descriptions of their development are provided by the references noted at the bottom of table 1.1.

Federal Electoral District (FED) An FED is the geographic area represented by one member of the House of Commons. For the 1966, 1971 and 1976 Censuses

Table 1.1
Geographical Areal Systems and Terminology Used by Statistics Canada

	Acronym	Equivalent Terms	Created For Statistical Purposes Only?	Covers Canada?	Non-Census Data Available From Statistics Canada?	Boundaries Subject To Change?	Approx. Number of Units[1]
Province/Territory	PR		No	Yes	Yes	No	12
Federal Electoral District	FED	Federal Riding	No	Yes	No	Yes	264[2]
Subprovincial Region	SPR	Economic Region	Yes	Yes	Yes	Yes	65
Census Division	CD	County, Regional District etc.	Some	Yes	Yes	Yes	265
Census Metropolitan Area	CMA		Yes	No	Yes	Yes	23
Census Agglomeration	CA		Yes	No	Yes	Yes	64
Census Consolidated Subdivision	CCS		Yes	Yes	No	Yes	2,500
Census Sub-division	CSD	Municipality etc. (See Table 1.2)	Some	Yes	Yes	Yes	5,000
Census Tract	CT		Yes	Yes	No	No	2,700
Provincial Census Tract	PCT	Area Aggregate	Yes	Yes	No	No	1,700
Enumeration Area	EA		Yes	No	No	Yes	42,000
(Block Face)			Yes	No	No	Yes	?

(1) As of 1976 Census

(2) 1966 Representation Order. The 1976 Representation Order has 282 ridings.

Further Information on these areal systems can be obtained from the following:

1976 Census Geographic Coding, Working Paper No. 3 – GEO 78

Census Metropolitan Areas Revision of the Delineation Criteria and Limits for the 1976 Census Working Paper No. 7 – GEO 78

Census Agglomeration, Revision of the Limits for the 1976 Census, Working Paper No. 5 – GEO 78

Census Consolidated Subdivisions, Origin, Definition and Application, Working Paper No. 2 – GEO 78

Standard Geographical Classification Manual, June 1976, Vol. 1, The Classification, publication 12-554.

of Population, the 1966 Representation Order was used. The 1981 Census follows the 1976 Representation Order. There is no relationship between federal ridings and provincial electoral districts.

Subprovincial Region (SPR) A geostatistical unit which is used to subdivide all provinces except PEI and the Territories into major regions. It was formerly called an economic region. In all provinces except Quebec, SPRs are made up of one or more census divisions. In Quebec, subprovincial regions are the province's administrative regions, and are aggregated from the census sub-division level.

Census Division (CD) In Nova Scotia, Prince Edward Island, New Brunswick, Quebec, Ontario and British Columbia they are the second tier of municipal government — usually called a 'county' or its equivalent (regional municipality, territorial districts, etc.). In British Columbia they are called regional districts. In Newfoundland, Manitoba, Saskatchewan and Alberta geostatistical equivalents have been created in agreement with the provincial governments. In these provinces the census divisions are numbered, whereas in all other provinces they have nonnumerical names.

Census Metropolitan Area (CMA) The main labour market area of an urbanized core (or continuous built-up area) having 100,000 or more population. CMAs are created by Statistics Canada and are usually known by the name of their largest city. They contain whole municipalities or census subdivisions. CMAs are comprised of (1) municipalities completely or partly inside the urbanized core, and (2) other municipalities, if (a) at least 40% of the employed labour force living in the municipality works in the urbanized core, or (b) at least 25% of the employed labour force working in the municipality lives in the urbanized core. Calgary and Saskatoon both have municipal boundaries large enough to encompass all their built-up areas and thus their definitions include the cities of Calgary and Saskatoon only.

Census Agglomeration (CA) A geostatistical area created by Statistics Canada and comprised of at least two adjacent municipal entities. These entities must be at least partly urban and belong to an urbanized core having a population of 2,000 or more. The urbanized core includes a largest city and remainder, each with a population of 1,000 or more, and has a population density of at least 1,000 per square mile (386 per square kilometre). CAs with an urbanized core of 100,000 or more, based on previous census figures, are called census metropolitan areas.

Figure 1.1

Hierarchical Arrangements of Statistics Canada's Spatial System*

EA ▷ CSD ▷ CD ▷	PR ▷ Canada
EA ▷ FED ▷ PR ▷	Canada
EA ▷ PCT	
PCT + CT ▷ PR ▷	Canada
EA ▷ CSD ▷ CMA/CA	
EA ▷ CSD ▷ CCS ▷	PR ▷ Canada
EA ▷ CSD ▷ CD ▷	SPR ▷ PR ▷ Canada (except Quebec)

EA	enumeration area	CT	census tract
CSD	census subdivision	PCT	provincial census tract
CD	census division	CCS	census consolidation subdivision
CMA	census metropolitan area	CA	census agglomeration
FED	federal electoral district	PR	province or territory
SPR	subprovincial region		

*The symbol " ▷ " means "aggregates to".
For example:
   "EA ▷ CSD ▷ CD ▷ PR ▷ Canada"
This means that EAs (enumeration areas) can be aggregated to produce complete CSDs (census subdivisions); CSDs (census subdivisions) can be aggregated to produce CDs (census divisions); and so on. Conversely, it can be said that Canada can be divided entirely into provinces and territories (PR indicates both provinces and territories); every province (or territory) can be divided entirely into census divisions; census divisions divide entirely into census subdivisions; and census subdivisions divide entirely into enumeration areas.

Figure 1.2.
Conformance of Areal Systems

	PR	FED	SPR	CD	CMA	CA	CCS	CSD	CT	PCT	EA
PR											
FED	X										
SPR	X										
CD	X		X(1a)								
CMA						X				X	
CA										X	
CCS	X			X							
CSD	X		X(1b)	X	X	X	X				
CT	X				X	X	(2)	(2)			
PCT	X						(2)	(2)			
EA	X	X	X	X	X	X	X	X	X	X	

(1a) Except in Quebec. (1b) There are exceptions to this in Quebec

(2) Previous to 1976, census tracts conformed to all census-subdivision boundaries. However, census tracts now conform only to those census subdivision boundaries that form the outside extent of a CMA or CA.

How to Use this Chart

Reading across the rows, if an X occurs to the *left* of the diagonal, the boundary of the row entry conforms to that of the column entry and will be located within it. (e.g. census tracts boundaries will not cross those of a province, census metropolitan area or a census agglomeration. Also the census tract, where it occurs will be *within* those areas)

Reading across the rows, if an X occurs to the *right* of the diagonal, the boundary of the row entry will not cross that of the column entry nor will either one be located within the other (e.g. a census tract boundary will abutt but never cross a provincial census tract boundary nor will they ever share the same land area).

A blank entry means that, in at least a few places, the conformance rule does not apply.

Census Consolidated Subdivision (CCS) A new and relatively little used geostatical system that groups a small number of geographically contiguous municipalities.[1]

Census Subdivision (CSD) The first tier of local government usually consists of an organized (incorporated) municipality with authority to levy taxes and with some form of elected government (e.g. city, town, village, borough, rural munici-

(1) Note: Quite often a municipality (census subdivision) such as a township will spatially surround another municipality such as a town. Data that are published by municipality will be for each place separately and the data for the township will *not* include the data for the town.

Table 1.2

The Distribution of Census Subdivision Types, Canada and Provinces, 1976

Type of subdivision	Province or territory												
	Canada Total	Nfld.	P.E.I.	N.S.	N.B.	Que	Ont	Man	Sask	Alta.	B.C.	Yukon	N.W.T
Municipalities													
City —	151	1	2	3	6	36	40	5	12	10	33	2	1
Town —	796	115	8	38	21	190	142	33	131	103	10	1	4
Village	1,060	—	26	—	84	252	121	40	338	137	60	—	2
Summer Village —	40	—	—	—	—	—	—	—	10	30	—	—	—
Borough —	5	—	—	—	—	—	5	—	—	—	—	—	—
Hamlet —	10	—	—	—	—	—	—	—	—	—	—	—	10
Cite —	32	—	—	—	—	32	—	—	—	—	—	—	—
Municipality	1,001	—	—	—	—	1,001	—	—	—	—	—	—	—
County Municipality —	30	—	—	—	—	—	—	—	—	30	—	—	—
Subdivision of County Mun. —	41	—	—	41	—	—	—	—	—	—	—	—	—
District Municipality —	37	—	—	—	—	—	—	—	—	—	37	—	—
Rural Municipality —	398	—	—	—	—	—	—	105	293	—	—	—	—
Township Municipality —	473	—	—	—	—	—	473	—	—	—	—	—	—
Municipal District —	30	—	—	12	—	—	—	—	—	18	—	—	—
Rural District —	11	11	—	—	—	—	—	—	—	—	—	—	—
Improvement District* —	14	—	—	—	—	—	14	—	—	—	—	—	—
Improvement District* —	19	—	—	—	—	—	—	—	—	19	—	—	—
Local Improvement District —	50	37	—	—	—	—	—	—	9	—	—	4	—
Local Government District —	23	—	—	—	—	—	—	23	—	—	—	—	—

Local Government												
Community —	138	138	—	—	—	—	—	—	—	—	—	—
Special Area —	3	—	—	—	—	—	—	—	3	—	—	—
Saskatchewan Hospital Area, Uranium City and District and University Endowment Area	3	—	—	—	1	—	1	1	—	1	—	—
Non-municipalities												
National Park —	6	—	—	—	—	—	—	1	—	5	—	—
Parish —	151	—	—	151	—	—	—	—	—	—	—	—
Royalty and Township	69	69	—	—	—	—	—	—	—	—	—	—
Subdivision (of Regional Dist.) —	60	—	—	—	—	—	—	—	—	60	—	—
Unorganized —	58	—	—	34	10	—	8	1	1	—	1	4
Unorganized Subdivision	93	93	—	—	—	—	—	—	—	55	—	—
Indian Reserves —	744	—	108	17	108	36	60	85	55	361	—	—
TOTAL	**5,546**	**396**	**108**	**112**	**279**	**1,581**	**913**	**274**	**882**	**410**	**562**	**8**	**21**

* Improvement Districts in Ontario and Alberta are respectively identified by names and numbers. —

pality etc.). For some areas that are unorganized, Statistics Canada creates geostatistical equivalents. Also, indian reserves are included as census subdivisions. Table 1.2 lists all the various types of census subdivisions and their occurrences across Canada.

Census Tract (CT) Permanent small census geostatistical areas established in large urban communities with the help of local specialists interested in urban and social science research. Census tracts are reviewed and approved by Statistics Canada according to the following criteria: (i) the boundaries must follow permanent and easily recognized lines on the ground; (ii) the population must be between 2,500 and 8,000 except for census tracts in the central business district, in industrial areas, or in peripheral rural or urban areas which may have either a lower or a higher population; (iii) the area must be as homogeneous as possible in terms of economic status and social living conditions and, (iv) the shape must be as compact as possible. All census metropolitan areas, all census agglomerations with a central city having a population of 50,000 or more, and all other cities of at least 50,000 population are eligible for a Census Tract Programme.

Provincial Census Tract (PCT) Designed to extend the census tract concept beyond the larger urban areas to cover the entire county. The target population is also 5,000. PCT's can include several whole municipalities in the more rural areas of Canada.

Enumeration Area (EA) The basic building block of the Census-taking operation. Its boundaries are set by the administrative requirements of collecting the Census. An EA is typically several city blocks or a large apartment building forming a population of approximately 500-1,000 depending on the number of households. In rural areas, EAs consist of areas of up to 100 farms.

Block-Face The basic unit used in major urban areas by Statistics Canada's Geographically Referenced Data Storage and Retrieval System (GRDSR), more colloquially called the 'geocoding' system. It consists of one side of the street between two intersections. A more complete description of this system is provided on page 30.

The relationships between these various systems are rather complex. Several of the areal systems are hierarchically related to one another so that there are no overlaps or omissions. The enumeration area is the only areal unit that never overlaps any other areal system. In many cases the boundaries of one of the other designations will overlap (or not *conform* to) the boundaries of another area. All the hierarchical arrangements are depicted in figure 1.1. The conformance relationships of these designations are depicted in figure 1.2.

Supporting Documentation[2]

A variety of documents are prepared by Statistics Canada to support the use of the various areal systems. In general, these supporting items consist of coding structures that facilitate the mechanical operation of storing and retrieving data by area, and visual aids in the form of maps to depict the physical boundaries of the relevant areas.

[2] The documentation described here refers to that information that was in effect at the end of 1980. The pending release of 1981 Census data will mean that a new set of geographic referencing material will be made available over the next few years. There is also a different set of documentation for earlier censuses (primarily 1971). Except for minor changes, the same types of documentation exist for each Census.

The Standard Geographical Classification (SGC) is the basic framework for coding three areal systems and could be especially useful to any organization that needs to assign geographic codes to its own data. The areal systems for which it provides a hierarchical framework are:

(1) provinces (and territories);

(2) census divisions; and

(3) census subdivisions

Census subdivisions aggregate to census divisions which, in turn, aggregate to a province or territory.

The relationship is reflected in the seven-digit SGC code.

PR	CD	CSD
xx	xx	xxx (x denotes one digit)

Collecting all entries under one particular combination of PR and CD codes would provide a total for all municipalities within that particular census division.

The SGC is available in the form of a printed manual or recorded on magnetic tape.[3] The magnetic tape file links SGC units to census metropolitan areas, census agglomerations and federal electoral districts. Statistics Canada's policy on the use of the Standard Geographical Classification aims to bring about the increased compatibility of different data sources.

Statistics Canada's Census of Population and Housing requires extensive spatial referencing information. In computerized form it is called the Census Geographic Master File and is a consolidation of the various geographic codes and names used for all areal designators from enumeration areas to provinces. It also links the Census codes with the Standard Geographic Classification[4].

Complete sets of maps are available for all areal systems used by Statistics Canada. In regular published form publication 92-811 diagramatically displays census subdivisions, census divisions, census agglomerations and census metropolitan areas. Census tract diagrams are provided in the relevant data publication (For 1976, publication 95-800 to 95-831) while, for 1976, provincial census tract diagrams are collected in four publications — 95-851, 95-853, 95-855 and 95-857. Detailed map sheets are available for the following areal systems (for the 1976 Census):

Series G76-10   — Provincial Maps showing the boundaries of census divisions, census subdivisions, indian reserves and census metropolitan areas

[3] publication 12-554 *Standard Geographical Classification Manual, June 1976 Vol. I, The Classification*

publication 12-555 *Standard Geographical Classification Manual, June 1976 Vol. II, The Numerical Index*

publication 12-556 *Standard Geographical Classification Manual, June 1976 Vol. III, Alphabetical Index By Province*

Publication 12-554 contains a complete description of the coding system.

Annual Revisions are published in publication 12-201 *Changes to Municipal Boundaries, Status and Names.*

Inquiries regarding the SGC on computer tapes should be directed to Standards Division, Statistics Canada, Ottawa K1A 0T6.

[4] Further information may be obtained from Census Geography Staff, Statistics Canada, Ottawa, K1A 0T6.

Series G76-12   — Rural Enumeration Areas (urban EAs are grôuped)

Series G76-13   — Census Tracts/Enumeration Areas. One map per census tract

Series G76-13A — Same as G76-13 but reduced to fit onto 8½" x 14" paper

Series G76-14   — Urban Enumeration Areas — for smaller urban areas with four or more EAs.

Series G76-15   — Census areal codes on National Topographic sheets

Series G76-17   — Single Enumeration Areas — one map for each EA

Series G76-18   — Federal Electoral Districts/Enumeration Areas — usually one map per federal electoral district. In urban areas these are the best maps to use for both EAs and CTs

Series G76-21   — Provincial Census Tracts

Further details may be obtained from the **Guide to Reference Maps Available for the 1976 Census**, Statistics Canada.

In recognition of the growing importance of the postal code for managing information files and for the generation and use of statistics, a Postal Code — Geographical Classification Code Conversion File has been compiled to facilitate linking of the various systems[5].

There are other area systems in use outside Statistics Canada for which the agency does not publish data. Most of these can be expressed in terms of Statistics Canada areas and the agency will co-operate with users in relating user-defined areas to the standard areas used by Statistics Canada.

Problems

The two most significant problems faced when using geographically-oriented data are:

- the area under study does not conform to the areas for which data are published.
- boundaries change over time therefore making historical comparison difficult or impossible.

In many cases, there is not much that can be done to avoid these problems. However, it is important to recognize the possible occurrence of one or both of these problems when using statistics, since they could lead to distortions in the analysis.

For example, municipalities often annex adjoining areas or completely amalgamate with a neighbouring municipality. In either case, calculated growth rates could easily be misleading unless compensating adjustments are made. In the case of a non-conforming study area it may be best, if possible, to redesign the study so as to conform to published boundaries. For thirty-one large urban areas, however, Statistics Canada has the 'geocoding' system to alleviate this particular problem for users of Census data. This system is more fully described on page 30.

Another source of confusion is the use of the same name for different areas. For example, the designation 'Toronto' could refer to any one of the following:

(i) the City of Toronto itself;

[5] See *Postal Delivery Area — Geographical Classification Code Conversion Table* and *Postal Code — Geographical Classification Code Conversion File User's Guide*, Standards Division, Statistics Canada, Ottawa, K1A 0T6.

(ii) the Municipality of Metropolitan Toronto consisting of the two cities and the four boroughs;

(iii) postal 'Toronto' which includes the city and parts of the surrounding five municipalities; and

(iv) the census metropolitan area, which includes 20 municipalities.

Sources

Besides Statistics Canada, there are many other government organizations which release data for specific areas within Canada[6]. The major government sources that publish these statistics are listed below:

Federal Government
Statistics Canada
Labour Canada
Canada Mortgage and Housing Corporation
Agriculture Canada
Revenue Canada

Provincial Government[7]
vital statistics registrar
industry/tourism/commerce
provincial statistical agency
municipal affairs
agriculture

Local Governments
planning department
assessment office

The greatest variety and volume of data for small areas originate from Statistics Canada. In general, these data can be divided into Census of Population and Housing data and the rest. Only the Census provides data for areas smaller than a municipality. The types of data and their availability from census to census are indicated in table 1.3. A very general guideline to the overall availability of non-census data is shown in table 1.4. However, because statistical publications vary tremendously as to what data they offer on a geographic basis, each data need should be pursued to the appropriate publication and, if necessary, a special request should be made to see if the required information is available elsewhere. Publication 12-566, **Guide to Sub-provincial Data (Excluding Census Data) 1979**, reviews all the other local area data sources provided by Statistics Canada. Statistics Canada's published output is listed and described in its **Catalogue of Publications**.[8] A more extensive listing of its most popular sources carrying geographically disaggregated data is presented on page 67.

[6] For a complete overview see *Directory of Canadian Urban Information Sources, 1977*, Ministry of State for Urban Affairs, Ottawa (ISSN-0318-7276)

[7] For reference, see *Statistical Information on Municipalities Available from Provincial and Territorial Governments*, Local Government Section, Public Finance Division, Statistics Canada

[8] Every catalogued publication released by Statistics Canada is assigned a five-digit catalogue number used for identification and filing. It is very important to quote this number when selecting particular publications.

Table 1.3
Topics [1] Covered in Census of Population and Housing Questionnaire[2]

	1961	1966	1971	1976	1981
sex	x	x	x	x	x
age	x	x	x	x	x
marital status	x	x	x	x	x
age at marriage	x		x		x
fertility	x		x		x
mother tongue	x		x	x	x
language most often spoken at home			x		x
knowledge of two official languages	x		x		x
ethnicity	x		x		x
place of birth	x		x		x
place of parent's birth			x		
immigration	x		x		x
citizenship	x		x		x
number of persons in dwelling	x	x	x	x	x
relationship to household reference person	x	x	x	x	x
family status and size	x	x	x	x	x
location of dwelling	x	x	x	x	x
type of dwelling	x	x	x	x	x
tenure	x	x	x	x	x
previous tenure	x		x		
age of dwelling	x		x		x
number of rooms	x		x		x
number of bedrooms	x		x		
number of bathrooms					x
bath, shower and toilet facilities	x		x		
garage	x		x		
type of water facilities	x		x		
source of water supply	x		x		
sewage disposal	x		x		
heating equipment	x		x		x
condition of dwelling	x				x
fuel types for heating	x		x		x
length of residency	x		x		x
where the person lived five years ago	x		x	x	x
how many moves since five years ago			x		
major appliance ownership	x		x		
automobile ownership	x		x		
vacation home ownership			x		
value and mortgage status of home	x		x		x
rent and other payments of rentors	x		x		x
costs of various dwelling expenses					x
school attendance	x		x	x	x
education level achieved	x		x	x	x
type of education			x	x	x
labour force activity	x		x	x	x
industry of employment	x		x		x
occupation	x		x		x
place of work			x		x
wartime service	x		x		
religion	x		x		x
income	x		x		x

[1] Topics are not necessarily on a one-to-one basis with questions.

[2] Wording and exact content of each question can change from Census to Census.

Table 1.4

The Geographic Availability of Statistics Canada Data for Major Data Topics* Other Than the Census of Population and Housing, by Geographic Level**

Data Topics*	Canada	Province	Subprovincial Region	Census Division	Census Metropolitan Area	Census Agglomeration	Census Subdivision
Agriculture	X	X		X			X
Manufacturing	X	X	X	X	X	X	X
Transportation	X	X			X		X
Communications	X	X			X		X
Construction	X	X	X	X	X	X	X
Merchandising	X	X			X		
Public Finance	X	X					X
Prices	X	X			X	X	
Labour	X	X	X	X	X	X	X
Education, Science and Culture	X	X			X		X
Health & Vital Statistics	X	X		X	X	X	X
Judicial	X	X					X

* Not all data within these broad categories are available for all areal breakdowns shown.

**Data are not always published for every geographic unit within each system.

Statistics Canada releases its information through various media: books/ booklets, microfiche/microfilm, computer tape, an on-line computer system called CANSIM, and ad hoc special requests.[9] It should be noted that much geographic detail is not published due to lack of general interest and the sheer volume of the data potentially available. However, more detailed data can often be produced by special request.

The following five chapters outline the range of available small area data and provide some case study type illustrations of their use. However, it is impossible in a booklet of this size to detail all the types of statistics and all their possible applications. Statistics Canada encourages any user needing statistical information to contact one of the regional offices or the Ottawa Central Inquiries office as listed on page 72.

Introducing the Community of Facton

Events in the following chapters are set in the fictitious community of Facton to demonstrate how statistical data can be obtained for communities and applied to help solve information problems. In order to provide realistic settings without restricting examples to particular existing communities, data for Facton and for its neighbouring community of Rapporto have been selected from various communities in Canada and changed only as necessary to disguise their identity.

Facton is described as a medium-sized city with a population of almost thirty-five thousand. Applications of statistical data described in the following chapters are typical of what can often be done for cities, municipalities, regional districts or other local areas of various sizes and in various locations across Canada.

The events described took place during the fall of 1980.

Chapter 2
Facton Examines
the Need for Day-care

It became necessary for municipal officials in Facton to assemble statistics relevant to the issue of day-care facilities.

The only comprehensive data source available for areas within a municipality is the Census of Population and Housing[1], conducted every five years alternately as the Decennial Census (e.g. the Censuses of 1961, 1971 and 1981) and the Quinquennial Census (e.g. 1966 and 1976). Much more information is collected for the Decennial Census than for the Quinquennial Census. The major differences in information available are indicated in table 1.3.

By using data from these Censuses, detailed demographic profiles can be drawn of particular areas within a city or municipality. In the fictitious community of Facton, the Census was the source of data to which municipal officials turned when it became necessary to assess the need for additional day-care facilities.

The data in table 2.1 were extracted from a publication providing 1976 Census data. There is an extensive series of such publications available from the 1976 Census that can provide broad demographic profiles of areas within Canada including municipalities and census tracts. The published sources are supplemented by a wide range of microfilm, computer tape and special request services.

The Social Service Department of Facton was aware that there existed a growing demand for day-care facilities despite the fact that the actual number of children in the community had been decreasing. Two main explanations had been proposed:

- an increasing tendency for both parents to work in order to provide more income for the family along with the growing preference of women to follow a career as well as raise a family.

- an increasing number of single parent families caused by higher divorce rates.

The Social Services Department recommended to city Council that a Joint Study Committee be commissioned comprising representatives from the Social Services Department, various residents' associations, the Board of Education and

[1] The Census of Population and Housing has been held in Canada regularly since 1871 as required by the British North America Act, although earlier Censuses had been held as far back as 1666. For a good historical description of the development of the Census, see: M.C. Urquhart and K.A. Buckley, *Historical Statistics of Canada*, The MacMillan Company of Canada, 1965, pp. 1-8.

Table 2.1
General Population, Housing, Household, Family and Labour Force Data for municipalities of 5,000 Population and over, 1976

No.	Characteristics	Province	Facton	Rapporto
	(Based on 100% data)			
1	POPULATION, 1971(1)	302,341	32,384	64,770
2	POPULATION, 1976	304,462	34,716	65,341
3	Land area in square miles, 1976	4,442.5	39.0	22.5
4	Land area in square kilometres, 1976	11 518.9	101.1	58.3
5	Population density by square mile, 1976	68.5	890.2	2,904.0
6	Population density by square kilometre, 1976	26.4	343.4	1 120.8
	SEX AND AGE GROUP:			
7	**Male, Total**	**144,935**	**17,490**	**32,335**
8	0 - 4 years	8,110	1,250	2,665
9	5 - 9 "	9,160	1,440	2,935
10	10 - 14 "	12,310	1,825	3,735
11	15 - 19 "	14,800	1,955	3,570
12	20 - 24 "	17,505	1,515	3,525
13	25 - 34 "	25,475	2,630	5,470
14	35 - 44 "	15,280	2,245	4,005
15	45 - 54 "	17,185	2,320	3,180
16	55 - 64 "	14,100	1,370	1,965
17	65 - 69 "	4,475	355	585
18	70 and over	6,525	590	700
19	**Female, Total**	**159,535**	**17,230**	**33,005**
20	0 - 4 years	7,565	1,115	2,595
21	5 - 9 "	8,760	1,355	2,800
22	10 - 14 "	11,700	1,730	3,565
23	15 - 19 "	15,160	1,750	3,810
24	20 - 24 "	19,155	1,390	3,695
25	25 - 34 "	24,500	2,635	5,420
26	35 - 44 "	15,975	2,260	4,080
27	45 - 54 "	19,490	2,285	3,280
28	55 - 64 "	17,350	1,325	1,965
29	65 - 69 "	6,360	425	695
30	70 and over	13,510	965	1,105
	MARITAL STATUS:			
31	**Single (never married), Total**	**141,350**	**15,395**	**31,560**
32	Single (never married), 15 years of age and over	83,745	6,680	13,270
33	Married(2)	139,535	17,625	30,690
34	Widowed	17,990	1,345	1,970
35	Divorced	5,580	360	1,120

TABLE 2.1 General Population, Housing, Household, Family and Labour Force Data for Municipalities of 5,000 Population and Over, 1976 — Continued

No.	Characteristics	Province	Facton	Rapporto
	(Based on 100% data)			
	MOTHER TONGUE:			
36	English	208,170	29,140	61,465
37	French	59,495	395	1,705
38	German	3,000	940	170
39	Italian	8,085	1,670	115
40	Ukranian	1,375	185	50
41	Other	15,970	1,705	1,050
42	Not stated	8,370	680	790
43	**OCCUPIED PRIVATE DWELLINGS, TOTAL**	112,375	10,290	19,695
44	Owned	43,480	7,805	9,485
45	Rented	68,895	2,485	10,215
46	Single-detached	35,595	7,075	8,545
47	Single-attached	16,640	1,315	2,170
48	Apartment	52,090	1,800	7,345
49	Duplex	6,020	95	1,260
50	Movable	2,025	−	375
51	**PRIVATE HOUSEHOLDS, TOTAL**	112,375	10,290	19,700
	By number of persons:			
52	1	31,055	1,110	2,605
53	2	34,540	2,645	5,035
54	3	17,565	1,945	3,865
55	4 - 5	22,970	3,725	6,380
56	6 - 9	6,105	855	1,780
57	10 or more	135	15	40
58	Average number of persons per private household	2.6	3.3	3.3
59	Family persons in private households	233,005	31,340	57,425
60	Non-family persons in private households	61,320	2,825	6,730
	By number of families:			
61	0	40,375	1,415	3,600
62	1	71,160	8,650	15,890
63	2 or more	830	225	210
64	**FAMILIES, TOTAL**	72,850	9,115	16,310
65	Husband-wife families	62,895	8,390	14,435
66	Lone parent families	9,950	725	1,870
	By number of children:			
67	0	25,915	2,575	4,135
68	1	18,415	2,135	4,050
69	2	15,100	2,490	4,155
70	3 - 4	11,495	1,690	3,450
71	5 or more	1,920	215	525

TABLE 2.1 General Population, Housing, Household, Family and Labour Force Data for Municipalities of 5,000 Population and Over, 1976 – Continued

No.	Characteristics	Province	Facton	Rapporto
	(Based on 100% data)			
	Children in families by age:			
1	Under 6 years	18,460	2,855	6,220
2	6 - 14	37,255	5,650	11,525
3	15 - 17	15,615	2,155	4,130
4	18 - 24	20,870	2,670	4,130
5	25 and over	5,065	510	680
6	*Average number of persons per family*	*3.2*	*3.4*	*3.5*
7	*Average number of children per family*	*1.3*	*1.5*	*1.6*
8	**Number of persons in families**	**233,005**	**31,340**	**57,425**
	(Based on sample data)			
	MOBILITY STATUS:			
9	Population 5 years and over	286,375	32,330	59,835
10	Non-movers	125,170	18,785	24,445
11	Movers	161,205	13,540	35,390
12	Non-migrants	93,130	4,510	17,160
13	Migrants	68,075	9,030	18,230
14	From same province (3)	27,745	7,225	8,865
15	Same census division	5,155	1,290	5,095
16	Different census division	22,320	5,915	3,680
17	From different province	23,750	500	7,635
18	From outside Canada	13,320	980	1,295
19	Province of residence in 1971 not stated	3,260	330	440
20	Population 15 years and over	246,855	26,000	47,050
21	Male	115,355	12,975	23,000
22	Female	131,505	13,030	24,050
	EDUCATION:			
23	Attending school full-time	31,795	2,725	5,400
24	Male	17,315	1,495	2,835
25	Female	14,485	1,235	2,565
26	Not attending school full-time (4)	215,055	23,280	41,650
27	Male	98,035	11,480	20,170
28	Less than grade 5 (5)	3,080	220	345
29	Grades 5 - 8	12,640	1,870	2,800
30	Grades 9 - 10	13,155	2,235	4,460
31	Grades 11 - 13	24,105	2,865	4,490
32	Post secondary non-university	11,480	2,090	3,955
33	Some university	12,430	1,175	2,075
34	With post-secondary non-university	4,910	565	730
35	Without post-secondary non-university	7,515	610	1,345
36	University degree	21,150	1,035	2,035

TABLE 2.1. General Population, Housing, Household, Family and Labour Force Data for Municipalities of 5,000 Population and Over, 1976 — Concluded

No.	Characteristics	Province	Facton	Rapporto
	(Based on sample data)			
	EDUCATION: – Concluded			
37	Female	117,020	11,795	21,485
38	Less than grade 5 (5)	3,945	295	300
39	Grades 5 - 8	16,405	1,800	3,010
40	Grades 9 - 10	16,865	2,350	5,100
41	Grades 11 - 13	35,105	3,775	4,860
42	Post-secondary non-university	19,725	2,175	5,320
43	Some university	12,615	970	1,755
44	With post-secondary non-university	6,515	560	905
45	Without post-secondary non-university	6,105	415	850
46	University degree	12,365	435	1,140
	LABOUR FORCE:			
47	Males in the labour force	87,515	10,655	18,205
48	*Participation rate*	*75.9*	*82.1*	*79.2*
49	15 - 24 years of age	22,225	2,380	4,850
50	25 - 44 ” ” ”	37,110	4,675	8,720
51	45 - 64 ” ” ”	26,160	3,355	4,400
52	65 and over	2,025	245	235
53	Employed	81,825	10,140	16,930
54	Unemployed	5,690	515	1,275
55	*Unemployment rate*	*6.5*	*4.8*	*7.0*
56	Females in the labour force	68,220	6,820	11,265
57	*Participation rate*	*51.9*	*52.3*	*46.8*
58	15 - 24 years of age	22,830	1,955	4,180
59	25 - 44 ” ” ”	25,790	2,945	4,845
60	45 - 64 ” ” ”	18,180	1,820	2,140
61	65 and over	1,420	95	95
62	Employed	63,645	6,405	10,190
63	Unemployed	4,575	410	1,080
64	*Unemployment rate*	*6.7*	*6.0*	*9.6*
65	Married (2) females in the labour force	35,125	4,565	6,890
66	*Participation rate*	*49.9*	*51.7*	*44.5*

Source:
publication 92-810, *Municipalities 5,000 Population and Over—Population and Housing Characteristics.*

Note:
The same data profile is published for each Census Tract in all the CMAs and larger CAs — in 1976, publications 95-800 to 95-831. These "Census Tract Bulletins" have been available for many previous censuses and are the most popular of profile information on urban areas. The source content varies from Census to Census depending on the questions asked by each Census.

As a simple method of ensuring confidentiality, almost all *counts* published by the Census of Population and Housing are randomly rounded to end in 0 or 5. Each published number is rounded separately so that totalling rounded data may not exactly match data that were rounded after being totalled.

the Planning Department. The city Council concurred and requested that the study be co-ordinated with one being undertaken in the adjoining, larger community of Rapporto.

The Joint Study Committee divided the study into three phases:

1. An overall examination of the need for day-care facilities.

2. A preliminary evaluation of potential sites.

3. A detailed review of demand in the areas of greatest potential need.

Phases 1 and 2 relied on information already available from Statistics Canada and other sources. For Phase 3, it was necessary to use data to be collected by a special survey of households in Facton being conducted by three residents' associations working independently of the Joint Study Committee. How this survey was planned and conducted is described in the next chapter.

General Review of the Need for Day-care

The first task of the Joint Study Committee was to assemble some relevant statistical information. The data in table 2.2 were obtained using table 2.1 and the corresponding 1971 information.

Although the data in table 2.2 pinpointed some important facts about the total number of children, including the number of lone parent families and the increasing participation of women in the labour force, they did not include the crucial data on the mix of working parents by number and age of children. These were available, in unpublished form[2], from a set of 1976 Census microfiches. Using this source, the Joint Study Committee constructed table 2.3

This table highlighted the number of children who needed some form of day-care in 1976. This was considered a low estimate of the true need because the Census did not measure the number of women who might have wanted to work but could not find adequate day-care arrangements for such reasons as there being no convenient facilities or because the family could not afford it — the cost of day-care outweighing the additional employment income.

Having determined the minimum probable number of children needing day-care, the Committee then examined the current supply of day-care facilities.

There were many different types of day-care arrangements possible, some of which did not require fees. Table 2.4 displays the use of the various arrangements. The data were originally produced from a special supplement to Statistics Canada's monthly Labour Force Survey and were highlighted in the publication *Perspective Canada II*[3].

If the situation in Facton and Rapporto was in line with the national pattern, the split of child-care arrangements in these places would be as shown in table 2.5.

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[2] "Published" in Statistics Canada terms, means a printed publication that has a catalogue number and appears in the Catalogue of Publications whereas "unpublished" means in any other form (special tabulations, microform or computer).

[3] publication 11-508E. This publication, along with the inaugural edition, *Perspective Canada I*, and a later edition, *Perspective Canada III* provide a fascinating analysis of many aspects of Canadian life.

Table 2.2

Selected Demographic Data, 1971 & 1976

	Province Number			Facton Number			Rapporto Number		
	1971	1976	% Change	1971	1976	% Change	1971	1976	% Change
Number of Children 0-5	23,745	18,460	-22.3%	3,145	2,855	-9.2%	7,995	6,220	-22.2
Number of Children 0-17	89,055	71,330	-19. %	11,795	10,660	-9.7%	23,190	21,875	-5.6
Husband-Wife Families	61,360	62,895	2.5%	7,330	8,390	14.4%	13,980	14,435	3.2%
Lone Parent Families	7,690	9,950	29.4%	600	725	20.8%	1,535	1,870	21.8%
Females in the labour force	52,075	68,220	31.0%	5,085	6,820	34.1%	8,755	11,265	28.7%
Total No. of Females over 15	116,375	131,505	13.0%	11,090	13,030	17.5%	21,575	24,050	11.5%

Source: 1971 Census of Population and Housing
1976 Census of Population and Housing.

Note: Numbers separately random rounded to end in 0 or 5. Totalling rounded data may not exactly match data that were rounded after being totalled. See notes table 2.1 and page 00.

Table 2.3

Number of Pre-school Children by Labour Force Status of Parent/Parents, 1976

	Number of Children 0-5	
	Facton	Rapporto
Lone Parent Family — Parent Employed	80	280
Two Parent Family — Both Parents Employed	900	1,405
Total	980	1,685

Source:
1976 Census of Population and Housing, Microfiche CTFAMB31 and CTFAMB33.

Table 2.4

Child-care Arrangements Made for Pre-school Children of Working Mothers in Canada, 1973[1]

Child Care Arrangements	Children Attending School Part-Time[2]		Children not Attending School	
	000's	per cent	000's	per cent
Mother works only when child is in school	27	14	—	—
Mother takes child to work	—	—	18	5
Total work oriented arrangements	33	17	18	5
Unpaid babysitting: By person over 15 years of age living in home	30	16	35	10
By brother or sister under 16	18	9	—	—
By neighbour, relative, friend, etc.	37	19	61	18
Total unpaid care arrangements	84	44	103	30
Paid babysitting: In mother's home	26	14	72	21
In home of sitter	30	16	103	30
Day care centre or nursery	—	—	24	7
Total paid care arrangements	63	33	198	57
Other arrangements	—	—	27	8
Total	190	100	347	100

[1] Totals do not add to the figures in the columns because the data have not been reweighted for non-responses.

[2] Includes children who are not yet attending school full-time but who are attending nursery or other schools for part of the day.

— nil

Source
publication 71-001, *The Labour Force*, September 1975; also, publication 11-508E *Perspective Canada II.*

Table 2.5

Possible Use of Child-care Facilities*

		Children 0 - 5 with Lone Parent/Both Parents Working	
		Facton	Rapporto
Work Oriented Arrangements	(9.5%)	93	160
Unpaid Care	(34.8%)	341	586
Paid Care	(48.6%)	476	819
Day-Care	(4.4%)	43	74
Other	(44.2%)	433	745

* Calculated by taking the percentage distribution of child-care arrangements and multiplying it times the appropriate number in table 2.3. For instance 476 was determined by 63+198=261 (table 2.4) divided by 190+347=537 (table 2.4) giving a result of 48.6%. The appropriate figure in table 2.3 of 900 was then factored by time percentage with a result of 476. The percentages in table 2.4 of 33% and 57% could not simply be averaged because of the different totals.

According to the records of the Social Service Department, which licensed day-care facilities, the following number of day-care spaces were available:

Table 2.6

Supply of Day-care in Publicly-Licensed Facilities

	Facton	Rapporto
Day-Care Spaces Provided at Work	—	20
Spaces in Licensed Day-Care Facilities	—	20
Total	—	40

These data implied that the number of day-care spaces available in Facton and Rapporto were 77 fewer than the absolute minimum that might be expected. This was calculated by first summing the "potential" demand according to the national pattern, as shown in table 2.5 (43 plus 74 equals 117). From this was subtracted the available supply of 40, as shown in table 2.6. The result implied that non-fee (unpaid) and in-home paid arrangements were being used more frequently as a result of the shortage of paid day-care facilities.

The Joint Study Committee summarized their findings as follows:

- The estimates in their analysis were extremely conservative because an increased number of people since 1976 could be expected to require child care. This was because assessment rolls indicated that the number of pre-school children had slightly increased at the same time that there was a growth in the female participation rate — that proportion of women who are considered part of the labour force, in relation to all women. Also, use of the 1973 survey likely understated the demand for day-care since, at that time, there was probably a significant number of people who would have preferred using day-care facilities rather than the other types of arrangements, but there were simply not enough facilities.[4]

[4] Further information on the trends in available day-care facilities were obtained from the annual reports *Status of Day-Care in Canada*, National Day-Care Information Centre, Health and Welfare Canada.

- Other, non-statistical evidence also indicated an unfilled need. The local Canada Manpower Centre stated that they were continually receiving requests for day-time sitters but were unable to find them. Also, the school boards reported that a growing number of parents seemed to want their children to start school early.
- It was felt that this situation had developed partly because the by-laws of both Facton and Rapporto prohibited private day-care facilities in most areas and neither city had provided many public facilities.

After having established these findings, the Committee decided to begin Phase 2.

Preliminary Evaluation of Potential Sites

Before specific investigations were begun to find actual sites, the Joint Study Committee wanted to obtain a general idea of the locations within their communities where the need was greatest. Using census tract data for Facton and Rapporto they constructed map 2.2 showing general areas of need. The same microfiche source was used as in table 2.3 to determine the total number of children in one- and two-parent families with lone parent/both parents working. These counts were mapped by census tract using the map published in the Census Tract Bulletin (map 2.1) as a base.

Map 2.1
Base Map Showing Major Roads and Census Tract Boundaries, Facton and Rapporto
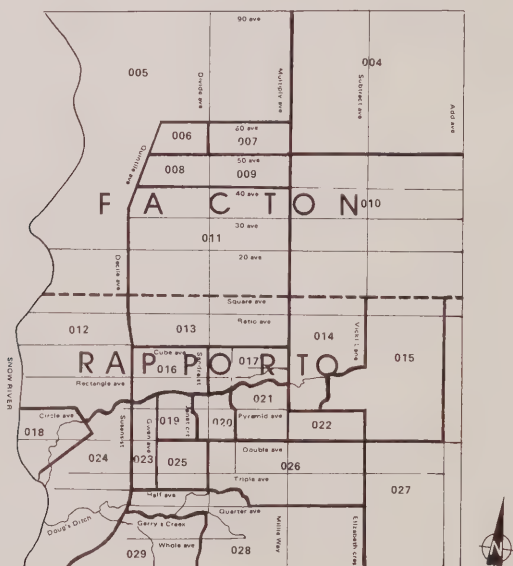
Map 2.2
Distribution of Potential Need for Day-care, by Census Tracts, Facton and Rapporto

ACTUAL NUMBER OF CHILDREN, AGES 0-5
WITH PARENT/BOTH PARENTS WORKING

0-74   75-150   150 +

The map highlighted the areas of greatest need and it was to these areas that the Committee turned their attention.

First, the Social Service Departments of the two communities plotted the existing facilities on the map and found that they were not well located in terms of the current location of need. This meant that sites probably could be found that would not conflict with established centres.

Secondly, they searched for various alternative potential sites (church basements, under-utilized schools, community centres) in the general areas of interest.

Having located these, they then had to evaluate the probable number of children to be served by each facility. Since the drawing area of the day-care centres would not conform to census tract boundaries, a different process was required to calculate the 'market' for a given day-care centre site.

After discussions with people in the day-care business, they decided to draw a two-mile radius around each potential site. The assumption was that most parents were not likely to use a centre that was further away. The problem now was to obtain statistics for these circular areas. Neither census tracts nor enumeration areas conformed to the boundaries of the circular areas. If either CTs or EAs were to be used, those that straddled the boundaries would have to be apportioned part in and part out. This would have been tedious and was likely to lead to errors.[5]

[5] Because of the automatic random rounding of all published Census of Population and Housing numbers up or down to a multiple of 5 to ensure confidentiality, any summing of low counts (5, 10, 15, 20, etc.) could result in significant error arising from the variability between the real number and the rounded number. Large numbers are proportionately much less affected by this procedure and its influence can be ignored in those cases. However, there were low counts for children ages 0-5 in enumeration areas and because of this, adding EAs could have introduced significant errors.

However, Statistics Canada's computerized *Geographically Referenced Data Storage and Retrieval System (GRDSR)*[6] was designed to alleviate exactly this type of problem. In most of the major urban areas (one of which included both Facton and Rapporto) the Census data are stored on computer, geographically referenced by block-face co-ordinates. These are spatial location points representing one side of a street between two intersections. The '+' marks on the following diagrams plot some of these block-face co-ordinates (called centroids) for areas in Facton.
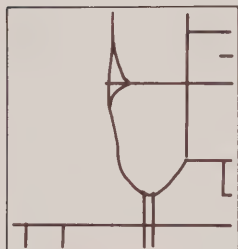
(1) STREETS THROUGH
    RECREATIONAL
    OR PARKLAND
    -- NO CENTROIDS
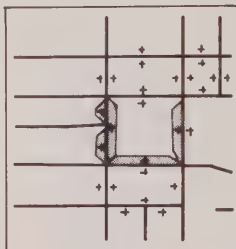
(2) STREETS IN REGULAR
    (GRID) PATTERN
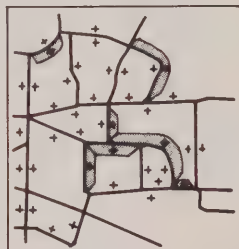
(3) STREETS IN IRREGULAR
    PATTERN

THE SHAPES OF SEVERAL BLOCK-FACES ARE SHOWN BY SHADED AREAS

The GRDSR System is designed so that an outline of an area that is defined using the same system of co-ordinates can be used to 'capture' all those centroids that are within the defined area. All individual records (in this case, families) that have these centroid identifications can then be tabulated according to the user's specifications.

Map 2.3 shows the location of the potential sites and their circular 'market' areas. Using the GRDSR system, the data in table 2.7 were extracted by Statistics Canada for each circular area surrounding each site. In this particular case, all that was needed by Statistics Canada in order to produce the necessary data, was a map showing the exact locations of the sites and instructions as to the size (radius) of the circles. If the areas had been irregular in shape, it would have been necessary to have maps describing the actual boundaries.

[6] For a more complete description, see *GRDSR: Facts by Small Areas*, Statistics Canada.

Map 2.3
Drawing Area for Potential Day-care Sites in Facton and Rapporto
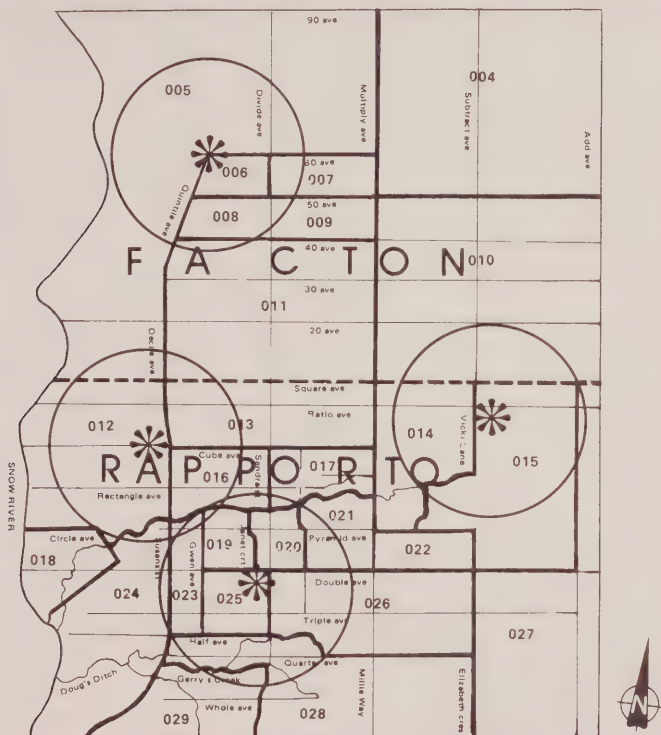
*Potential Day-care Sites

Table 2.7
Special Tabulation on Children, Aged 0-5, by Various Characteristics for Alternative Areas Within Facton and Rapporto

	Site 1	Site 2	Site 3	Site 4
Total Number of Children 0-5	857	1,244	933	622
Number of Children in lone parent families				
— with parent working	35	98	42	35
— with parent working and no one else living in the household older than 16 and not in school	25	90	34	28
Number of Children in two-parent families				
— with both parents working	295	360	230	152
— with both parents working and no one else living in the household older than 16 and not in school	215	300	180	120

Source: 1976 Census of Population and Housing, Special Tabulation

Table 2.7 illustrates another important service that is available to users of Census data — custom designed cross-tabulations[7]. Although a considerable variety of cross-tabulations are published, it is impossible to anticipate all those that could be required. Therefore, Statistics Canada will retabulate data from the original records according to the user's specifications within the usual confidentiality restrictions and on a cost-recovery basis.

In this case, the additional information allowed the Committee to assess whether there were many lone parent and two-parent working situations where someone else in the household, such as a nanny or a grandparent, was available to take care of the children. This was required to respond to an argument put forward by a member of Council who was reluctant to have Facton and Rapporto become involved in providing day-care.

The Committee was then able to rank the potential sites by priority:

Table 2.8
Priority Ranking of Potential Sites

Priority	Site	Potential Need*
1	2	458
2	1	330
3	3	272
4	4	187

*Defined as children in families with both or lone parent working — summing lines two and four in table 2.7.

Data for the Detailed Review of Demand at Individual Sites

As with most such studies, the Joint Study Committee project achieved the best possible "blend" of information by first making maximum use of available statistical data, interpreted and analysed using the best available expert opinions. For the third and final phase in the study, data were to be obtained from an original and local source, a survey that was being designed and conducted independently by a group of residents' associations in order to develop information on a variety of social issues.

It was necessary to go to this source because 1971 Census income data were regarded as too old and the 1981 Census data would not be available for some time. The day-care portion of the survey was expected to provide data on the type and volume of demand for day-care at each of the potential sites within the community.

Several months later, when data were available from the survey conducted by the residents' associations, the Joint Study Committee was able to finally complete its work and present the Social Service Departments of Facton and Rapporto with very specific recommendations as to what type of day-care facilities were needed and where.

The details of this final phase of the Joint Study Committee project are not elaborated here. For general guidance on how to interpret and analyse original data applying to particular locations, data users should contact advisors in Statistics Canada regional reference centres.

The following chapter describes generally how residents' associations in Facton were able to plan and conduct their own survey.

[7] A term meaning a compilation of data by various characteristics — such as age, by sex, by labour force activity, by mother tongue, rather than a tabulation of one characteristic at a time.

Chapter 3
Designing a Survey of Facton Residents

In some cases, data that are required for a particular community are not available from Statistics Canada or any other source and must be collected by the community itself. Two basic types of surveys are possible. A Census type survey may be conducted in which all the units in a target population (say the households in Facton) are surveyed. For instance, constructing a list of voters or compiling data on all businesses in Facton would be two typical examples of the census approach. Such a process is extremely expensive and quite often is simply not necessary because a survey of a selected proportion of the population, called a sample, will provide data from which it is possible to draw inferences about the entire population. Opinion polls are a common example of this approach.

A precise mathematical science exists for designing samples that will obtain results within specified accuracy limits. It is neither possible nor necessary to explain all the associated theory here.[1] The following description of experience in Facton will illustrate some of the basics in sample design and describe how readily-available geographical information can help in planning the survey and in assessing the validity of the results.

The explanations and illustrations in this chapter are not intended to provide sufficient information to enable inexperienced people to conduct their own surveys. Survey-taking can be a time-consuming and expensive exercise that may well lead to unusable results if the entire process is not directed by a qualified person. The survey of the residents of Facton is described only for illustrative purposes and many important technical aspects in its design are not elaborated.[2]

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[1] More complete information can be obtained from:

W. Burges,	*Facts and Figures: A Layman's Guide to Conducting Surveys*, Institute for Responsive Education, Boston, Massachusetts, 1976.
C. Dixon & B. Leach,	*Sampling Methods for Geographical Research*, Institute of British Geographics, London, England, 1978.
L. Kish,	*Survey Sampling*, John Wiley and Sons, New York, New York, 1965.
D.A. Krueckeberg & A.L. Silvers,	*Urban Planning Analysis: Methods and Models*, John Wiley & Sons, Inc., Toronto 1974, pp. 30-59

Also, Statistics Canada provides advice and courses on both questionnaire design and survey sampling. Contact: Federal Statistical Activities Secretariat, Statistics Canada, Ottawa K1A 0T6.

[2] Community organizations considering conducting a survey of their own should consult one of the following for expert guidance:
- professional survey-taking organizations (many of which are listed in *The Directory of Survey Organizations*, Federal Statistical Activities Secretariat, Statistics Canada)
- qualified academics
- appropriate government officials in local, provincial or federal departments.

There had been considerable controversy in Facton for several years over five major issues: off-street parking, a new city hall, day-care facilities, senior citizen housing and high-rise developments. To date, the city Council had seemed to turn a blind eye to social needs such as day-care and senior citizen housing, while being all too ready to promote such developments as a new civic center and more high-rises. Having attempted to debate with Council in a disorganized and ad hoc manner and not being at all effective, three citizens' groups combined to establish a united front as the Coalition of Facton Residents' Associations (COFRA).

The basic conclusion of their preliminary strategy sessions was that previous representations had relied mostly on rhetoric and anecdotal evidence without presenting any solid statistics to support their viewpoints. A survey was needed and, since it would have been prohibitively expensive to canvas all residents, COFRA decided to undertake a sample survey of the residents of Facton.

The first and most crucial planning step taken by COFRA was to *carefully determine the exact type of information needed in order to reach their objectives*. Many surveys fail because the resulting information does not answer the questions that are of basic concern to the matter under study. This is usually due to neglecting to specify the objectives and how the survey will accomplish them.

The second thing COFRA did was, with the help of a qualified survey adviser, to design a questionnaire that would elicit the needed information efficiently and accurately[3]. The third step was to undertake the survey itself, through the following activities:

- determining the required accuracy of their study and the sample size
- determining the best method of administering the questionnaire
- determining a cost-effective sampling design
- providing for a method of verifying data produced
- carrying out the survey
- compiling the results
- analyzing the results
- evaluating, documenting and disseminating the results.

Many of these activities were interdependent. For example, sample design and methodology were related and the drawing of the sample (choosing those to be surveyed) would depend on the method to be used. The sample size required was dependent on the required accuracy and the types of analyses to be carried out. Consequently, many of these components were planned concurrently.

Determining the Required Accuracy and Sample Size for the Survey

COFRA felt that to ensure that the results of their survey would be taken seriously by Council, they would have to be certain that all sources of potential error were minimized. This required careful attention to:

- sampling error — those errors caused by surveying only a portion of the population to infer about the total population. The major determinant is the size of the sample, as discussed below.

[3] The *Social Concepts Directory for Statistical Surveys*, a non-catalogued Statistics Canada publication, was very useful in phrasing questions that would produce data compatible with other sources.

- non-sampling error — those errors arising during the carrying out of the survey — non-response (the error attributable to the differences between respondents and non-respondents), poor questionnaire design, mistaken or misleading response, non-uniformity in interviewing standards, mistakes in recording and processing the responses.

In choosing a sampling approach there were two basic choices:

- probability sampling — selection of the sample based on the randomization principle. The theory of probability sampling requires that all units within the population have some chance of being selected. This does not have to be equal but it must be measurable. This method allows an accurate estimation of sampling error and is less prone to certain types of non-sampling error.
- non-probability sampling — selection of the sample without regard to the principle of randomization. Haphazard, volunteer, judgemental and quota sampling are all examples. Generally, these approaches are cheaper and operationally more convenient, but there is little opportunity to assess the degree of possible error.

COFRA felt that, since they needed accurate statistical results with a measured degree of error, a probability sampling technique should be used.

In determining sample size, they were pleasantly surprised to discover that the required sample size has little to do with the overall size of the population except for very small populations. Probability laws allow that a surprisingly small sample can usually be used to represent a large population. The experienced advisor assisting COFRA with their survey design pointed out that selecting the correct size of sample was not a simple matter of selecting a set percentage, say 5%, 10% or 20%, of the population to be surveyed. It was, in fact, a rather complex process that depended on many different factors and needed very careful planning. Much of the decision on how many households to sample, and how to select those households, depended on the particular type of data that it was expected to produce from the survey. It also depended on the precision that was expected of those data.

An example of a statement of precision for this purpose would be, for instance, that a particular figure included in the survey output must be within a range of plus or minus five percent from what the actual results would have been if a survey of the entire population, a census type survey, had been undertaken; and that this accuracy would be achieved nineteen out of twenty times. In other words, there is to be only a one in twenty chance that the survey results will not be in the range of plus or minus 5%.

In essence, probability sampling relies on the laws of probability which allow a measured estimate of the likelihood that a result could not happen by chance. After discussions on the importance of various alternative accuracy specifications, COFRA decided to use those described above. In different circumstances, much narrower limits could have been used, requiring a much larger sample size. However, the additional cost of a larger sample was not considered worth the increased level of accuracy.

Having decided upon the desired level of accuracy required, COFRA still had some essential details to decide before determining the actual sample size they would need to use. Firstly, accuracy limits would have to be determined for all separate components of the end tabulations because the sample size would have to be sufficiently large to allow COFRA to have specified confidence in statistics to be produced for particular segments of the population. In order to do this, it was

decided to draw up blank tables of the data that they expected to use from the survey. Table 3.1 displays one part of this pre-planning:

Table 3.1

Subdividing the Sample
(X represents a certain %)

	East Facton	West Facton	All of Facton
Single Detached	X	X	X
Single Attached	X	X	X
Row	X	X	X
Apartment	X	X	X
Total	X	X	100%

The sample size required to ensure the needed level of accuracy for sub-categories of each of the headings (e.g. detached or apartment for East or West Facton) would be larger than if tabulations were being made without subdividing the sample. This is because the accuracy of data produced for each sub-cateogry depends on the portion of the sample relevant to that particular sub-category.

Another consideration for determining the required sample size was the expected response rate. For example, if three thousand completed in-home interviews were required, and if it was estimated that twenty per cent of persons would either refuse the interview or could not be contacted, resulting in an 80% response rate, then the initial sample size would have to be 3,750 ($\frac{4}{5}$ of 3,750 is 3,000). COFRA was advised that other types of surveys, such as those using mailed questionnaires would normally have a much lower response rate. Around 50% is considered good for a mail survey. In the present example this would mean that 6,000 questionnaires would be required ($\frac{1}{2}$ of 6,000 is 3,000)[4].

For the purpose of its study, COFRA was advised by the survey advisor assisting them with the project that a completed sample size of 800 was needed. Allowing for up to 20% of the contacts to be unsuccessful, this meant that 1,000 units would have to be sampled. These figures were arrived at after considering the desired level of accuracy required, the type of data to be produced, the type of sampling procedure to be used (discussed below) and the interview technique to be employed.

Determining the Best Method of Administering the Questionnaire

COFRA reviewed the three basic approaches possible for administering the questionnaire — mail, face-to-face and telephone. The following general advantages and disadvantages for each approach were discussed in terms of their particular situation.

	Response Rate	Cost	Speed	Accuracy	Restrictions to Questionnaire
Mail	lowest	cheapest	slowest	lowest	medium
Face-to-face	highest	costliest	medium	highest	least
Telephone	medium	medium	fastest	medium	most

[4] A useful guide to help in designing mail surveys is: *Mail Surveys: Improving Response Rates*, Statistics Canada

The Association chose the "face-to-face" (or "in-person") approach for its significant advantages and because its usual drawback, high cost, did not apply to them since they could conduct the survey using their own members as volunteer interviewers. It was necessary, however, to undertake a considerable effort in training the interviewers — something that would not have been necessary for a mail survey. The questionnaire took about twenty-five minutes to complete and was felt to be slightly too long to administer by telephone.

A final consideration in choosing the face-to-face interview approach was that it helped COFRA to make its presence known in the community and to mobilize its members, thereby reinforcing their personal commitment. The choice of the face-to-face interview approach could have worked against the goals of the Coalition if respondents had felt that it did not permit them to remain anonymous. COFRA decided that their survey was unlikely to lead to problems in this respect because responses would not be associated with individuals and questions did not elicit information that was particularly personal in nature.

Determining an Effective Sampling Design

COFRA still had two basic decisions to make regarding their survey design:

- to determine what was their target population (all households, all families, all persons over 18, all parents, all household heads, or whatever).
- to determine how to randomly select those to be interviewed.

Since their goal was to make representations to Council on a variety of issues of which the most important source of opinions and facts would be the household, COFRA established the target population as all households in Facton. The next step was to obtain a "sample frame", a *listing* of all units within the population under study. How this was obtained is discussed in the following.

Each element of the sample frame must have some chance of being selected into the sample. There are many techniques which can be used in this selection process:

- simple random sampling
- systematic sampling
- stratified sampling
- unequal probability sampling
- area sampling
- cluster sampling
- multi-stage sampling
- multiphase sampling
- replicated sampling

Several techniques can be used together as, for example, in stratified cluster sampling or multi-stage area sampling.

The technique selected for COFRA by its survey advisor was "multi-stage area sampling". "Area sampling" involves listing smaller geographic areas within the total region to be sampled, and selecting a random sample of these areas. In this case the total region was Facton and the geographic areas were all those enumeration areas which, taken together, covered the entire community — the city of Facton. The multi-stage aspect refers to the process of sampling segments of the population and then sampling again for a random selection of units within each of

these segments. In this case the segments were the enumeration areas and units within the segments were households. Randomly selecting enumeration areas was the first "stage" of sampling and randomly selecting households within enumeration areas was the second "stage".

This sampling technique — multi-stage area sampling — was chosen for COFRA's survey because it was relatively simple and inexpensive and because it was known that necessary materials for it could be obtained from Statistics Canada.

A listing of all enumeration areas within Facton, totalling 68, was obtained from publication 99-812, **Enumeration Area Reference List**. Since these EAs varied in number of households from just over 100 to almost 400, a weighting procedure was needed to ensure that all households had an equal chance of selection. This was accomplished by assigning a listing range, representing the cumulative number of households for each EA in proportion to the number of households in each EA. (For the 1976 Census, these data are found in Microfiche Series EADHHA 11.) Listing ranges were recorded as shown in the following:

EA Code	Number of Households	Listing Range
01 001 001	220	1-220
01 001 002	330	221-550
01 001 003	305	551-855
01 001 004	280	856-1135
:	:	:
:	:	:
01 001 068	125	10842-10960

Since COFRA had 20 volunteers who would do the interviewing, they decided to select 20 enumeration areas in the following fashion. To cover the full listing range of 10,960 households, they took the EA to which every 548th number in the listing range corresponded. The number 548 was selected by dividing 10,960 (the total target population) by 20, 20 being the sample size for this first stage in the sampling process. Selection was begun with a random start by selecting a number between one and 548. The number 120 was drawn. The EAs corresponding to listing numbers 120, 668, 1216 and so on until 10,532, were selected. In the above table EA 01001001 and 01001003 are two that were selected. Maps of these EAs were then obtained from Statistics Canada (Map Series G76-17 or G76-18). Each volunteer interviewer was then asked to list all residences in his or her enumeration area, sequentially numbering each entry.

COFRA's survey advisor had set 1000 as the sample size needed allowing for up to 20 percent non-response. This meant that 1000 interviews would be conducted to ensure at least 800 completed questionnaires. With 20 volunteers, the workload would be 50 interviews per volunteer. Using a set of random number tables[5] 50 households were selected at random from each list and identified as the sample households.

After careful training of the volunteers, the survey was administered to the selected 1,000 households.

[5] A set of numbers that were generated without any pattern — completely randomized. By following a table of these numbers (as instructed in any book that publishes them) a random choice can be made from a list of addresses.

Verification

Once the interview results of the survey sample were tabulated and analysed, an important task remaining was to verify if they could be safely regarded as representative of the views of the total population.

COFRA used three approaches to verification. Firstly, with their survey advisor, they calculated mathematically the sampling error that could be associated with each of the statistics they had produced. This turned out to be extremely close to what had been planned.

Secondly, they compared the answers to three of their questions to data available from the Census, as shown in table 3.2 and found the patterns to be very similar.

And thirdly, they reviewed their survey operations to determine if any problems associated with non-response could have introduced error into their results. This might have occurred if people for whom interviews had been attempted, but not completed, had tended to have needs and opinions which were distinctly different from what the survey results inferred for the total population. After reviewing the list of non-responding households and finding no apparent pattern, and considering that the response rate had been good for surveys of this type (820 successfully completed interviews out of 1000 attempted), COFRA decided that non-responsive "bias" could be effectively eliminated as a potential source of significant error.

Table 3.2

Comparison of Sample Data and Census Statistics

	Sample Characteristics	Census Data*
% Single Detached Dwelling	78.2	75.4
% Apartment	10.5	12.4
% Other	11.3	12.2
% Owned	75.6	71.0
% Rented	24.4	29.0
% Family Households	93.2	89.3
% Non-Family Households	6.8	10.7
% Husband-Wife Families	89.1	88.4
% Lone Parent Families	10.9	11.6

*Source: publication 92-810 *Municipalities 5,000 Population and Over—Population and Housing Characteristics, 1976 Census.*

The verification evidence convinced city Council that the opinions and needs identified by the survey were representative of the majority of households in Facton.

Reviewing Results of the Survey

To use results produced from the sample to make numerical statements about all the households in Facton, it was necessary to "expand" or "blow-up" the sample results to see what they implied for the total population. For this, it was necessary to know the "weight" of the sample — the number of households represented by

each household in the sample. Since there had been an equal probability of selecting any household, then each response reflected an equal proportion of the total population. In this case there were 820 responses representing a total population of 10,960 households — each response representing 13.37 households. Thus, if 75 households in the sample indicated a need for day-care, it could be said that, in all of Facton, 1003 (75 x 13.37) households felt that they needed day-care.

After the survey had been completed, a special advisory group reviewed both the technical aspects of the survey procedure and the validity of the overall approach. Technically they were satisfied with the survey design although there was some frustration in the analysis stage because the sample size was too small to allow many interesting cross-classifications of the data that had not been anticipated at the pre-planning stage. An oversight in survey design was identified in the lack of a precise procedure for defining who within the household was to be interviewed. This might have been a serious problem because of the importance of consistently selecting the most appropriate person to speak to within a household in order to ensure that data recorded are as representative as possible. However, in discussions with the interviewers it was discovered that they had always spoken to a parent or other adult and this led COFRA to conclude that no significant bias had been introduced as a result of ambiguity in the directions to interviewers.

City Council reacted positively to the results of the survey and undertook several initiatives to respond to the needs and views identified.

COFRA was pleased by the spirit of co-operation and the increased citizen involvement that was sparked by participation in the survey and discussion of its results.

The Coalition of Facton Residents' Associations, with the aid of its survey advisor had successfully carried out its own data collection, tabulation and presentation of findings. However, as they pursued some of their causes they were confronted by critics who charged that they had failed to consider economic realities in some of their proposals. The next chapter describes how the city's new Industrial Commissioner had just recently produced information that could be used to discuss this point.

Chapter 4
Facton's Economic Profile

The structure and trends in the economy of a community are extremely important to the prosperity of the area. A strong economy normally raises incomes and promotes social well-being. A weak or declining economy can often amplify existing social problems or create new ones.

Unfortunately, there is no comprehensive measure of economic performance for cities in Canada which could correspond to the gross national product at the national level. The data-gathering problems of producing such a measure would be difficult if not impossible to overcome.

There are, however, some data that can give an indication of specific aspects of a local economy, at least enough to provide a broad indication of structure and trends.

Growth had come easily to Facton in the past. Because of its proximity to an expanding metropolis, many families had moved in during the 1960's and early 1970's. Some industry was attracted by the proximity to a major market and by the growing labour pool. However, with the change in the general economic climate, growth had slowed down during the latter part of the 1970's. The city found itself squeezed for assessment revenues and short of job opportunities for its residents. Spurred by the local Chamber of Commerce, city Council set up an Economic Development Committee consisting of representatives of the city Council, the Chamber of Commerce and the public at large. In addition, they hired a full-time Industrial Development Commissioner who was assigned the responsibility of co-ordinating and planning new efforts to attract more business to Facton.

The Commissioner identified three major tasks to be completed in his first year:

- Analyze the city's current economic strengths and weaknesses
- Prepare an economic development strategy
- Prepare a factbook that would inform potential businesses about Facton.

Both the first and third points involved collecting a considerable amount of information. Specifically, the Commissioner sought information on:

- population
- employment
- type of industries (i.e. manufacturing)
- income

- work place of residents
- the financial picture for the city
- availability and cost of industrial land.

Part of this process included compiling data for several years back in order to demonstrate what changes were taking place and how quickly they were occurring.

Population

Population trends were easily obtained for Facton.

Table 4.1

Facton's Population

	1961	1966	1971	1976
Total Population	21,780	27,690	32,385	34,715
Five-Year Compound Annual Growth Rates		4.9%	3.2%	1.4%
Number of Households	5,288	7,100	8,778	10,290
Average Household Size	4.1	3.9	3.7	3.3
Level of Education Attained Secondary School (% over 15 years of age)	21.4		25.9	26.4
University Degree (% over 15 years of age)	3.4		6.5	7.3

Sources: 1961 Census of Canada, Vol. I and Vol. II

1966 Census of Canada, Vol. I and Vol. II

1971 Census of Canada, Vol. I and Vol. II

1976 Census of Canada, publication 92-810 *Municipalities 5,000 Population and Over— Population and Housing Characteristics.*

The population figures presented in table 4.1 demonstrate that Facton was fairly strong in terms of population growth, household growth and level of education achieved. Although the *rates* of growth were decreasing, Facton was doing relatively well by comparison with other areas. A check with the local Planning Commission indicated that population growth since 1976 had stabilized in the 1.5—2.0% growth range. By checking these data with figures for other communities, the Commissioner confirmed that Facton's population growth was higher than normal for comparable areas.

Employment

The strength of the Facton labour market was assessed by analyzing Census data from 1971 and 1976 as shown in table 4.2.

Because these employment data are taken from Censuses, they provide "snapshots" of two points in time — June 1, 1971 and June 1, 1976. More up-to-date data are available monthly from a publication entitled *The Labour Force*, (publication 71-001). *The Labour Force* provides only limited sub-provincial data, so that figures for Facton were not available in it. However, it was nonetheless useful in providing data with which it was possible to assess the probable implications of national and provincial trends for the local economy in Facton.

Table 4.2

Employment of Facton Residents Compared to Province

| | Facton | | Province | |
	1971	1976	1971	1976
Labour Force				
Total	14,435	17,475	324,881	385,622
Male	9,350	10,655	213,845	234,077
Female	5,085	6,820	111,036	151,545
Participation Rate				
Total %	64.6	67.2	58.3	62.3
Male %	83.1	82.1	77.8	77.2
Female %	45.9	52.3	39.3	48.0
Unemployment Rate				
Total %	5.9	5.3	5.4	6.2
Male %	4.4	4.8	4.2	5.2
Female %	8.7	6.0	8.5	7.8

Source: 1971 Census of Canada, publication 94-705, *Labour Force by Age and Sex, for Urban Centres.*

1976 Census of Canada, publication 92-810, *Municipalities 5,000 Population and over — Population and Housing Characteristics.*

Definitions: Participation Rate — Total Persons 15 years of age or older in the Labour Force (employed and unemployed) as a percent of all persons 15 years of age or older.

Unemployment Rate — Total unemployed[1] as a percent of Labour Force.

The detailed data available for Census years, such as those shown in table 4.2, provided a basis for assessing these implications by relating trends in Facton to provincial and national trends.

Commuting Patterns and Industrial Activity

Figure 4.1 was prepared by the Industrial Development Commissioner to demonstrate the very mobile nature of the workforce.

The high volume of commuting outflow can be attributed to the presence nearby of a large metropolis. The large inflow indicates that industries in Facton draw from a wide area. However, because the information was somewhat dated, it was necessary to consult the city's Transportation Department to determine if current daily flows of traffic still reflected this pattern. The Transportation Department had recently conducted a survey on origin/destination and trip purpose to update this particular information and the results showed that the commuting pattern was essentially unchanged.

One of the objectives that had been set by the Economic Development Committee was to reduce the number of people commuting out of the city to work elsewhere. This meant encouraging industrial growth in those sectors that would provide appropriate job opportunities for the residents of Facton.

One way to determine which industries offered the most potential for providing employment opportunities locally, was to examine the current industrial em-

[1] The definition of unemployed changed slightly between 1971 and 1976. This is typical of the type of problem that can be faced when comparing statistics for different time periods. In this case, the definitional change was not regarded by the Commissioner as significant enough to affect the comparisons.

ployment profile of Facton residents as shown in table 4.3. The information in the table indicated that Facton residents were employed in office and store-based industries more than in manufacturing which was currently the predominant industry providing employment within Facton. Thus the Commissioner began to consider promotional plans to encourage more office and store-based industries to locate in Facton so as to provide local employment opportunities more suitable to its residents.

Figure 4.1
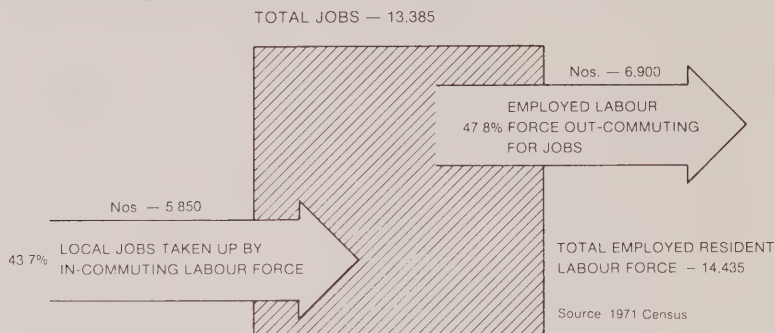
The Exchange Pattern in Facton For Employment, 1971

TOTAL JOBS — 13.385

Nos. — 6.900

EMPLOYED LABOUR
47 8% FORCE OUT-COMMUTING
FOR JOBS

Nos — 5 850

43 7% LOCAL JOBS TAKEN UP BY
IN-COMMUTING LABOUR FORCE

TOTAL EMPLOYED RESIDENT
LABOUR FORCE — 14.435

Source 1971 Census

Table 4.3

Profile of Resident Labour Force and Workplace Employment, 1971

	Employment in * Facton (Place of Work)	Resident ** Labour Force (Place of Residence)
	%	%
Primary Industry	2.0	2.7
Manufacturing	46.2	19.7
Construction	5.1	3.9
Transportation, Communication and Utilities	3.6	6.6
Wholesale Trade	4.8	6.7
Retail Trade	10.3	13.9
Finance, Real Estate & Insurance	3.3	7.2
Education, Health and Welfare	11.6	14.6
Services	8.9	15.3
Public Administration	3.2	6.2
Unspecified	1.0	3.2
	100.0%	100.0%

Source: 1971 Census of Canada, publication 94-745, *Industry Divisions and Major Groups by Sex, Place of Residence and Place of Work.*

Definitions: * Industrial classification of those persons working in Facton regardless of where they live.

** Industrial classification of those persons living in Facton regardless of where they work.

Unfortunately the most current data on industry of employment by place of work that the Commissioner could obtain were from the 1971 Census of Population. The upcoming results of the 1981 Census were expected to indicate some significant changes in the mix of industrial opportunities in Facton since there had been considerable growth of institutional construction that could be expected to raise the number of employment opportunities in education, health and welfare as well as in public administration. Information on these construction trends was obtained from building permit data and assembled as shown in table 4.4:

Table 4.4

Facton

Estimated Value of Construction: Building Permits
(in thousands of dollars)

	Residential	Industrial	Commercial	Institutional/ Government	Total
1971	6,347	1,270	1,152	1,530	10,299
1972	10,215	380	2,617	1,165	14,377
1973	10,912	1,269	12,404	9,952	34,537
1974	˙8,202	3,692	3,684	5,166	20,744
1975	30,735	364	2,523	3,230	36,852
1976	12,259	283	579	170	13,291
1977	4,122	22	2,411	2,400	8,955
1978	17,971	2,670	1,047	4,842	26,530
1979	25,878	690	1,470	3,022	31,060
1971 to 1979	126,641	10,640	27,817	31,477	196,645

Source: publication 64-203, *Building Permits.*

Figure 4.2

Facton
Annual Value of Building Permits

Source: publication 64-203, Building Permits

In total, the institutional/government sector accounted for some 16% of all permit values. When this was compared to the national average of approximately 9%, it seemed likely that Facton was developing a wider job base by lessening the predominance of the manufacturing sector as shown in table 4.3. Thus, the building permit data suggested that the city seemed to be slowly moving towards the goal of more people living *and* working in Facton. This was implied because it seemed likely that the future labour force would experience more of the type of employment that appealed to them becoming available within Facton as the new non-manufacturing enterprises began to recruit employees.

The growth of total building permit values from 1971 to 1979 was over 300%, significantly higher than for comparable communities. This was an interesting discovery. However, it was difficult to determine from the tabulated data if any long-term trends were taking shape. In order to identify possible trend patterns, the Commissioner drew up the graph shown in figure 4.2.[2] From this it was apparent that there was no overall growth trend evident through the frequent and extreme variations in building permit values.

Statistics Canada's Annual Census of Manufactures provides a detailed examination of the manufacturing plants (establishments) in Canada. Table 4.5 is a small extract from this data which the Commissioner obtained for his economic profile of Facton:

Table 4.5

Manufacturing in Facton

	1971	1977
Number of Manufacturing Establishments	73	63
Total Employment	7,482	9,870
Total Shipments (000's $)	56,842	134,040

Source: Publication 31-209, *Manufacturing Industries of Canada: Sub-Provincial Areas.*

Although the number of manufacturing establishments dropped, both production and employment were up. This seemed to correspond with the national trend of fewer but larger manufacturing plants.

Table 4.6

Manufacturing Plants by Employment Size, 1977

	Facton		Province	
Number of Employees	Number	Percent	Number	Percent
less than 20	31	49.3%	5,421	58.5%
20-49	11	17.5%	1,671	18.0%
50-99	6	9.5%	882	9.5%
100-199	5	7.9%	659	7.1%
200-499	4	6.3%	455	4.9%
500+	6	9.5%	186	2.0%
	63	100.0%	9,274	100.0%

Source: publication 31-209, *Manufacturing Industries of Canada: Sub-Provincial Areas.*

[2] For a detailed discussion on the clear presentation and interpretation of statistical data in graphic form, see: L.F. Schmid *Handbook of Graphic Presentation*, 1979, John Wiley and Sons, Toronto.

As shown in table 4.6, the size distribution of plants in Facton was significantly different from that for the province, especially in terms of the number of large plants. This heavy dependence on a relatively small number of large plants was a mixed blessing. Although these plants could be expected to provide better job security and higher incomes, if any did close or lay off a large proportion of their workforce, there would be a serious economic impact on the community.

Incomes

The latest available comprehensive information on the incomes of Facton residents came from the 1971 Census with its data on 1970 incomes. From this source were gathered the figures shown in table 4.7:

Table 4.7

Income

	Facton	Province
Average Family Income	$11,598	$10,878
Average Household Income	$11,699	$11,004
% Families over $20,000	7.1%	5.3%

Source: 1971 Census of Canada, publications 95-731 to 95-759, *Census Tract Bulletins, Series 'B'*. These are the best sources of 1971 Census profile data for those municipalities that are located within a census metropolitan area or census agglomeration.

Because inflation and the population growth of Facton determined that the numbers in table 4.7 would have changed dramatically since 1971, the Commissioner decided not to use them in his reports. However, he was able to obtain estimates from another source[3] to help fill out the general picture on incomes while waiting for the release of the 1981 Census data. He was also able to obtain current wage trends for employees in Facton as shown in table 4.8.

Table 4.8

Wage Trends — Industrial Composite*

	Facton	Province
1971 Average Weekly Earnings	$148.30	$142.20
1979 Average Weekly Earnings	$322.48	$285.92
% growth over 1971	117.5%	101.1%

Source: publication 72-002, *Employment, Earnings and Hours.*

* All industries except agriculture and public administration — The survey only covers those establishments with 20 or more employees.

Data in table 4.8 seemed to confirm that wage levels in Facton were slightly higher than those for the province, as had already been seen in table 4.7. They also indicated that wage levels were growing somewhat faster than the provincial average. This situation tended to discourage those new businesses that were seeking lower-cost labour while it attracted certain types of commercial enterprises which would see an advantage in the higher average purchasing power of the area.

[3] publication 13-207, *Income Distributions by Size in Canada.* This publication monitors incomes on an annual basis for Canada and provinces and biennially for major metropolitan areas.

The Industrial Commissioner assembled the following additional data items from a variety of other sources in order to further expand the general picture of Facton's economy:

- assessment revenue by type of activity (Facton Finance Department)
- average income based on income tax returns (Revenue Canada)
- current population estimates (Facton Planning Department)
- average wage rates by occupation (Labour Canada and corresponding provincial agency)
- current retail trade estimates (several private companies).

Factbook of Capsule Information

Besides these economic data from Statistics Canada and other sources, the Industrial Commissioner needed the following items to include in a *"Factbook on Facton"* that he was preparing:

- Facton budget statement (Facton Finance Department)
- mill rate (Facton Finance Department)
- geographic description of the location of Facton in relation to nearby centres (map)
- climatic conditions (Environment Canada)
- community services (several city departments)
- schooling (school board)
- recreational facilities (Facton Parks and Recreation Department)
- housing availability and cost (Statistics Canada, Canada Mortgage and Housing Corporation and Real Estate Board)
- churches
- media
- utilities and power (Public Utilities Commission and provincial authorities)
- transportation facilities (Facton Transportation Department)
- accommodations (Visitor's Bureau).

He then identified some important components that he did not yet have namely:

- directory of available vacant industrial land
- directory of all major businesses in Facton
- availability of commercial and office space
- population projections
- trends in retail, wholesale and services sales

Of the five information components that he did not yet have, he found that estimates for the first three could be put together fairly easily through means which were readily available to him. The last two, "population projections" and "trends in retail, wholesale and services sales," remained as the troublesome "gaps" in his dossier on the economy of Facton.

For the missing data on "trends in retail, wholesale and services sales," the Commissioner proposed to the Economic Development Committee that Facton apply to the provincial government for cost-sharing help in setting up its own

census-type survey to obtain data directly from business establishments operating within its boundaries.

For the needed data on population projections, the Commissioner and the Economic Development Committee approached the Planning Department to undertake a population projection study. The information it would provide would give important direction in deciding meaningful growth targets and in planning for possible economic consequences associated with population trends.

Because the Planning Department recognized the importance of the need for population trend data to support economic forecasting and for other purposes, they undertook the population projection study described in the next chapter.

Chapter 5
Projecting the Population of Facton

Planning for the future of a city, municipality or other community requires some guidelines as to what numbers of people will be living there in the coming years. If growth is expected, then services such as roads, sewers and water supply must be developed to accommodate additional demands. Or, it is possible that a close look at trends will reveal no growth and even a dwindling population in the future. Administrators and politicians may then be faced with the inability to pay for current levels of services without raising taxes. In a period of declining population, costs are likely to continue to increase but revenue, especially in the form of per-capita grants, will decrease. This may prompt efforts to foster growth by aggressively soliciting new industries or undertaking other initiatives. In any event, hardnosed decisions will probably have to be made about the community's ability to pay for services in the future.

The Planning Department of Facton had undertaken several population projections during the past ten years which had seriously over-estimated the growth in population. Because of this, a thorough study was made of the projection methods used in the past and possible alternative approaches were examined. Five broad categories of population projection methods were identified:

Different Ways to Project Population

1. **Mathematical extrapolation** — This method, the one Facton had used in the past, simply 'extends' the historical rate of total population change (usually growth) into the future. A multitude of mathematical equations have been developed to establish some precision for this method of extension.[1] Figure 5.1 illustrates the method applied by Facton in 1968. The rate of change for a previous fifteen year period, 1951 to 1966, was calculated from Census data and assumed to continue for the next fifteen years. Unfortunately, changing trends in birthrates, the reduced rate of immigration and a slowing economy created a significantly lower growth rate for Facton and meant that municipal services built to accommodate the projected growth were not fully utilized. Nor were there the increases in the number of rate payers needed to pay for the additional services. Another disadvantage of this method was that it provided no detail about age groupings or birth, death and migration rates to use in further analysis.

[1] *Urban Planning Analysis, Methods and Models*, D.A. Kruekeberg and A.L. Silvers, John Wiley & Sons, Inc. 1974, pp. 259-273.

Figure 5.1

**Facton
Population Projection
Extrapolative Method**
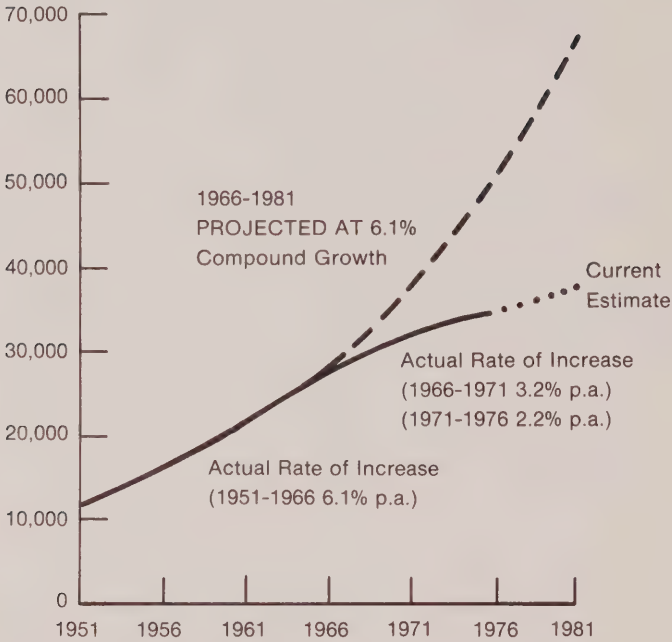
Source: Census of Population and Housing

2. **Ratio Method** — This approach utilizes an existing projection for a larger area (e.g. a province). The proportion that the city, district or municipality historically has had of the province's population is presumed to continue and thus the projection for the province is prorated to the municipality. Detailed projections identifying particular groups within the population are sometimes possible with this method but only for areas for which the necessary data are available.

3. **Component Method and the Cohort-Component Method** — These two methods utilize the same general approach but differ in detail. The former is calculated using total population while the latter sub-divides the population into age groups (or 'cohorts'). The component approach divides population change into three separate 'components' — births, deaths and net migration (in-migration minus out-migration). Statistics Canada prepares detailed population projections for Canada and the provinces by single years of age for both males and females using the cohort-component method under varying sets of assumptions of births, deaths and migration. This was the other method used by Facton in their revised set of projections and is described below. This meth-

od involves calculations which are labourious if done by hand. However, it can be computerized and many large municipalities and all provinces have already done so.

4. **Economy-based Methods** — Whereas the previous three methods usually require strong assumptions about migration trends from the past continuing into the future, this method attempts to 'explain' why people move into an area (more jobs) or leave an area (loss of jobs). Migration is an important aspect of the population of smaller areas (a new community for instance, may be made up almost entirely of "in-migrants") and is the most variable. The variability of migration in or out of a community is one of the factors that can lead to error in population projections based on past trends.

   In this approach the future economy of an area is projected and the resulting effects on population movement are calculated. However, because of the inherent difficulties of predicting an area's future economy, this method is difficult to apply unless future economic developments are known with some certainty. These could include, for example, plans to build a large steel smelting plant or a major industrial park.

5. **Land-use Methods** — sometimes referred to as the **Housing Approach**. This methodology is particularly suited to built-up municipalities in which there is a limited amount of land that can be built on or redeveloped. By calculating how many housing units could be built (in accordance with zoning by-laws) and with a knowledge of the average household size, a city or municipality can estimate the likely additions to the population, given a presumed rate of building to reach the saturation point. This approach is extremely sensitive to the average household size factor and the assumptions regarding housing unit construction. However, it is one of the most often used methods for forecasting the population of sub-areas within a municipality.

The Planning Department determined that, whatever the projection technique used, much would depend upon the validity of any "assumptions" that were to be made. The projection could include, for instance, a stable relationship between the size of the population of Facton and the size of the population of the province. Other assumptions used could involve future fertility rates, death rates and migration patterns. The operating assumptions used as the basis for the approach to projection would need very special attention and the Planning Department determined that, in future, all such assumptions for population projections would be reviewed in committee before calculations were begun.

Due to the need to make some important decisions with regard to their official plan and its provisions for growth, the Planning Department decided to do two separate projections of population from a 1976 base year to 2001, using a different type of approach for each projection. The ratio approach was used first, in order to provide a check on the more complex cohort-component method that was to be applied to provide more detailed data on future population trends.

The Ratio Approach to Population Projection

Table 5.1 shows the historical relationship that Facton had had with its province. Although it grew somewhat faster relative to the province between 1966 and 1971, it maintained its approximate share for the last five years shown in the table with the exception of 1976. A close examination of the 1976 anomaly indicated

Table 5.1

Facton's Historical Population Ratio With The Province

	Province Total[1]	Facton[2]	Facton as a Ratio of Province
1966	696,092	27,690	.0398
1967	712,703	28,825	.0404
1968	722,245	29,863	.0413
1969	738,501	30,818	.0417
1970	755,103	31,643	.0419
1971	770,312	32,385	.0420
1972	780,994	33,130	.0424
1973	790,883	33,792	.0427
1974	805,410	34,187	.0424
1975	817,220	34,685	.0424
1976	826,453	34,715	.0420

[1] publication 91-201, *Estimates of Population for Canada and the Provinces.* Figures for 1966, 1971 and 1976 are Census counts.

[2] 1966, 1971 and 1976 are Census counts adjusted for boundary changes. Intervening years are estimates compiled by Facton.

that a plant closing had reduced the population for that year but the city had regained its traditional population growth rate since then. Therefore, the planners made the assumption that, although the ratio would grow slightly over the next twenty years, it would do so at a slower rate until it matched the province's change. Table 5.2 displays the calculations used.

Results produced using this approach were dependent on both the accuracy of the provincial projections and the assumption that the historical ratio between Facton and the province would continue.

Table 5.2

Ratio Projection of Facton's Population

	Province Projection[1]	Facton's Ratio[2]	Facton's Projection[3]
1981	873,089	.0430	37,542
1986	917,457	.0435	39,909
1991	956,085	.0437	41,814
1996	986,195	.0438	43,195
2001	1,008,547	.0438	44,174

[1] publication 91-520, *Population Projections for Canada and the Provinces* (low fertility and migration assumptions)

[2] 1981 value calculated by taking 1981 estimated population for Facton (Figure 5.1 — 37,542) and dividing it by the 1981 projection for the provincial population. Subsequent ratios were calculated on the assumption that the ratio cannot continue to get larger over an indefinite time period. The method was simply to half the difference in ratio for each time period — .0430 (1981) minus .0420 (1976) is .0010 so 1986 value is .0005 plus .0430 which is .0435 (1986).

[3] Column 1 multiplied by column 2.

Cohort-Component Method Projection

The second approach used by the Planning Department was the cohort-component method (sometimes called the cohort-survival method) with the base

year set for 1976. Considerably more information was needed than for the previous techniques used. It was necessary to assemble data for:

- base year population by sex and five-year age groups (cohorts). The use of five-year groupings is arbitrary. Any other interval could be used, such as single years or ten-year age groups.

- survival rates by sex and age cohorts for each time period. Survival rates (which are calculated from life tables or from death rates) indicate the probable number of people in an age cohort who will still be alive at the end of each projection period.

- fertility rates for female cohorts or the general fertility rate. These are used to calculate the number of births in each projection period. The general fertility rate refers to all women 15-49 whereas the age-specific fertility rates refer to each age cohort. Although it is probably the more frequently used approach, the latter technique is more sensitive to errors in projecting the age detail of young adult migrants.

- net migration estimates for each sex and age cohort. This estimate is the most difficult aspect of projecting population for communities since accurate records of in-migrants and out-migrants are not available. One popular method is to calculate net migration for the immediate past period (i.e. between the 1971 and 1976 Census) as a residual figure by calculating the effects of births and deaths on the base population and comparing this to the end of period population. The difference is assumed to be equal to net migration. The difference also includes Census count error as well as error in calculating births and deaths but, since these are almost impossible to measure, they are ignored.

Assumptions for Projecting a Range of Future Population Levels

The cohort-component method of projecting population requires making careful assumptions about future trends in survival rates, fertility rates and net migration rates. In projecting populations for communities, the most difficult of the three types of assumption is that concerning the net migration trend since this is usually the most volatile component of population change for an area.

The Facton Planning Department set about establishing their assumptions by first examining the historical trends in their population. They then reviewed available reference literature on population projections (see list on page 56) and spoke to knowledgeable officials in the provincial government and Statistics Canada before establishing their own set of assumptions.

In order to develop a *range* of projections for population levels in the future, the Facton planners decided to do three separate cohort-component projections, using different assumptions in each. These were:

- a *reference* projection, for which it was assumed that historical fertility, survival and net migration rates would remain steady from present to the end of the latest projection time period.

- a *high* projection, for which it was assumed that fertility rates would not decrease any further, survival rates (especially in older age cohorts) would substantially increase, and net migration would contribute significantly to population growth.

- a *low* projection, for which it was assumed that fertility rates would drop further than current levels, survival rates would increase only slightly, and net migration would contribute little to population growth.

The reference projection provided an estimate of future population based on the assumption that current rates would continue into the future. The high and low projections provided the probable bounds of variability, the "extremes" between which future population levels were likely to fall.

Details and Complexity

Table 5.3 is a summary worksheet used by the Facton Planning Department for calculating their reference projection. With its footnotes, it indicates generally the type of data that must be gathered and the kind of calculations that must be made for the cohort-component method of projection. The detailed methodology of the projection technique is *not* explained here because that is beyond the scope of what can be provided in a general guide such as this.

In specific applications of this or any other projection technique, it will usually be necessary to adapt the approach to suit particular circumstances such as the type and detail of data available, assumptions made, and the projections it is hoped to produce. For guidelines on how to apply cohort-component and other projection techniques, consult the sources listed at the bottom of this page.[2]

Table 5.3 shows calculations only for females. Male cohorts would be processed the same way except that the fertility rate columns would be excluded. The projections for the total population would be compiled by summing the two.

One of the biggest advantages of the cohort-component method for Facton was that it allowed a detailed analysis of future population trends. For example, it can be seen from table 5.3 that, although fertility rates were assumed to remain constant from 1971 to 1985, there were actually more births projected for the last period than for either of the previous two five-year periods. This is because of the increasing numbers of women from the post-war baby-boom cohorts and from migration who were projected to enter the peak child-bearing age groups. This particular development could be expected to have its effect on many aspects of community planning including health, schools and child care.

Having compiled these detailed projections, the Planning Department was able to begin specific policy development programs based on some anticipated population trends. The projections would be useful in future years as actual population levels became known and could be compared against projected levels.

One important application of these projections was to serve as one of the basic inputs to a major housing review which included an examination of potential demand in the future. In the following chapter, the importance of population projections in predicting future housing demand will be apparent as the methods used in the housing review are explained in some detail.

[2] The following references present detailed instructions on how to prepare population projections:
United Nations, *Methods for Population Projections by Sex and Age, Manual III*, New York, 1956
United Nations, *Methods for Projections of Urban and Rural Population, Manual VIII*, New York, 1974
U.S. Bureau of the Census, *Guide for Local Area Population Projections*, Washington, 1977.

Table 5.3

Extract From Worksheet Showing Cohort-Component Reference Projections (Female) for Facton

Cohorts	Col. 1 1971 Actual Population	Col. 2 1971-1975 Survival Rates per 1,000	Col. 3 1971-1975 Fertility Rates per 1,000	Col. 4 1971-1975 Births	Col. 5 1971-1975 (Estimated 1976 Population)	Col. 6 1976 Actual Population	Col. 7 1971-1975 Estimated Net Migration	Col. 8 1976-1980 Births	Col. 9 1981 Survivors	Col. 10 1981 Projection Estimate	Col. 11 1981-1985 Births	Col. 12 1986 Survivors	Col. 13 1986 Projection Estimate
Survivors													
Females													
0 - 4	1,290	982.2		1,044	1,025	1,115	+ 90	1,326	1,302	1,392	1,542	1,514	1,604
5 - 9	1,750	998.5			1,288	1,355	+ 67		1,113	1,180		1,390	1,457
10 - 14	1,870	998.5			1,747	1,730	- 17		1,353	1,336		1,178	1,161
15 - 19	1,610	997.5	204.5	329	1,865	1,750	-115	357	1,726	1,611	352	1,337	1,222
20 - 24	1,135	997.5	599.0	680	1,606	1,390	-216	833	1,746	1,530	916	1,607	1,391
25 - 29	955	997.0	661.0	631	1,132	1,480	+348	978	1,386	1,734	1,146	1,525	1,873
30 - 34	980	996.0	340.0	333	951	1,160	+209	394	1,474	1,683	572	1,727	1,936
35 - 39	1,130	994.0	125.5	142	974	1,070	+ 96	134	1,153	1,249	157	1,673	1,769
40 - 44	1,220	990.1	28.0	34	1,119	1,190	+ 71	33	1,059	1,130	32	1,237	1,308
45 - 49	1,145	984.2	1.5	2	1,201	1,155	- 46	2	1,171	1,125	2	1,112	1,066
50 - 54	850	975.9			1,117	1,125	+ 8		1,127	1,135		1,098	1,106
55 - 59	605	962.4			818	760	- 58		1,083	1,025		1,092	1,034
60 - 64	420	943.0			571	565	- 6		716	710		967	961
65 - 69	350	912.4			383	425	+ 42		516	558		648	690
70 - 74	270	862.6			302	340	+ 38		367	405		481	519
75 - 79	225	780.2			211	280	+ 69		265	334		316	385
80 - 84	140	648.1			146	190	+ 44		181	225		216	260
85 +	95	435.3			102	150	+ 48		148	196		183	231
	16,040			2,151 (x .4855)	17,063	17,230	+672	2,731 (x .4855)	17,886	18,558	3,177 (x .4855)	19,301	19,973

Footnotes to Table 5.3

These calculations are based on an assumption that fertility rates experienced between 1971 and 1975 inclusive, the survival rates for the same period, and the net number of migrants all remain unchanged in the succeeding time periods. However, these could be easily altered depending on the scenarios envisaged by the person doing the projections. The accuracy of the projection is obviously dependent on the accuracy of these assumptions. This worksheet is presented to demonstrate the kind of calculations required to make a cohort-component projection. For sources providing specific directions, see the references listed on page 00.

Column 1 — Source: publication 92-715, *Age Groups*

Column 2 — Calculated using death rates from publication 84-206, *Vital Statistics Vol. III, Deaths*. This is done by taking the average annual death rate for the five-year period compounded at a declining rate, the result of which is multiplied by 1,000. In mathematical terms,

$$SR = 1,000 \times \frac{1}{(1 + i)^n} \quad \text{when } SR = \text{Survival Rate}$$

i = annual average death rate
n = number of years

In essence, this rate states the probability that a person who is in a certain age bracket will live from the beginning to the end of the particular time period. Published life tables are often used to calculate survival rates.

Column 3 — Fertility Rates indicate the number of children that women in a certain age bracket are likely to give birth to in a particular period of time — publication 84-204 *Vital Statistics, Vol. 1 Births*. The annual published fertility rates were added for the five years to get the five-year rates.

Column 4 — Column 3 times Column 1. The entry opposite 0-4 indicates the total of all births factored by the number who will be female (48.55%) — using information from publication 84-204, *Vital Statistics, Vol. 1 Births*.
An alternative approach for this calculation would have been to apply the same fertility rates to the average mid-year population, $\left(\dfrac{\text{population 1971} + \text{population 1976}}{2}\right)$.

Column 5 — Column 2 times Column 1 with its cohorts dropped one age bracket. That is, the survival rate for the next succeeding age bracket is applied to the number in the cohort. For example, the 955 women, ages 25-29 in 1971 are multiplied by the survival rate for the age bracket 30-34 to obtain the 1976 estimate (migration held aside for the moment). The births calculated in Column 4 are factored by the 0-4 survival rate.

Column 6 — Source: publication 92-823, *Five-Year Age Groups*

Column 7 — Column 6 minus Column 5. The result is assumed to be net migration since Column 5 includes births and deaths of persons in 1971. This calculation also includes any error in Census counts, fertility rate and survival rate calculations of Columns 2 and 3. These errors are ignored, largely because they are impossible to measure. The calculation also includes births and deaths of migrants. With more work, the net migration could be re-calibrated to extract these components, but Facton decided to disregard this aspect.

Column 8 — Column 3 times Column 6. The entry opposite 0-4 indicates the total of all births factored by the number who will be female (48.55%). Alternative calculation possible, as noted for column 4.

Column 9 — Column 2 times Column 6 as for Column 5.

Column 10 — The projection estimate calculated by taking Column 9 and adding Column 7. No survival rate or fertility rate calculations are made with the migration estimates since these are assumed to be part of the residually-derived estimates. If the estimates had been derived using another method, then it might have been necessary to apply separate fertility rate and survival rate calculations (usually at half the rate).

Column 11 — Column 3 times Column 10. The entry opposite 0-4 indicates the total of all births factored by the number who will be female (48.55%). Alternative calculation possible, as noted for column 4.

Column 12 — Column 2 times Column 10 as for Column 5.

Column 13 — Column 12 plus Column 7 with same assumptions, as in Column 10.

Chapter 6
Housing in Facton

One of the essential goals of good community management is the assurance of an adequate supply of housing at affordable prices. The housing market functions according to interactions between many factors, including new construction demand from house buyers, existing housing stock, zoning regulations, the availability of basic services and changes in the financial climate.

Within this setting, municipal or city government plays an essential role. It must:

- *prepare and amend as needed, proper zoning regulations and planning policies*
- *assess the need for assisted housing for groups such as senior citizens and those with low incomes*
- *plan and undertake required capital works programs*
- *provide clear direction to the development industry as to desired and permissible development*
- *provide subdivision appraisals and building permits.*

The Facton Planning Department needed to take a fresh look at the housing situation for several reasons. Firstly, the high growth expectations of the early 1970's had resulted in a current surplus of registered lots. This left some doubt as to whether planned new subdivisions would ever be built and whether new applications should be processed. Secondly, despite the recent slow growth, there had been some activity in the housing market as the type of demand changed and there was concern as to whether the new trends in construction would satisfy the changing demands of house buyers and renters. Thirdly, the results of their recently conducted population projections and their recent residents' survey had both raised doubts as to whether there would be adequate housing for senior citizens in the future. In order to decide on these and other housing issues, the Planning Department undertook a *Housing Needs Study*.

The Study involved assembling considerable data. Fortunately, almost all the data needed were readily available from existing sources:

- current housing/household characteristics
- current supply trends
- future demand.

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Current Housing/Household Characteristics

It was discovered that the most complete and detailed data available for housing units and households came from the Census of Population and Housing. Statistics Canada calls housing units "dwellings" and defines a household as that group of people occupying a single dwelling.

Table 6.1
Basic Housing and Household Characteristics in Facton

	1971	1976	1976 % of Total	% Change '71-'76
Occupied Private Dwellings				
— Total	8,680	10,290		18.6
— Tenure: Owned	6,770	7,805	(75.6)	15.3
Rented	1,910	2,485	(24.4)	30.1
Type				
— Single-detached	6,565	7,075	(68.8)	7.8
— Single-attached	1,030	1,315	(12.8)	27.7
— Apartment	1,000	1,800	(17.4)	80.0
— Duplex	80	95	(1.0)	18.8
— Mobile	—	—		
Private Households				
— Total	8,680	10,290		18.6
— Family	7,810	8,875	(86.3)	13.7
— Non-Family	870	1,415	(13.7)	62.6
Average Number of Persons		3.3		

The descriptive information in table 6.1 was extracted for Facton from table 2.1 and the corresponding 1971 Census sources. Several significant features were pinpointed for the city:

- Family-oriented housing represents 86.3% of total.
- Single attached plus single detached comprise 81.6%.
- Owner-occupied represents 75.6%.
- 1971 to 1976 growth of occupied private dwellings was 18.6%, significantly higher than the population growth of 7.2% (from table 2.1).

Additions to the housing stock by type were obtained from Statistics Canada by special request and followed the same general pattern of stock type as in 1976.

Table 6.2
Housing Completions in Facton, by type*

	Single	Double	Row	Apartment	Total
1976**	127	12	9	21	169
1977	310	5	8	60	383
1978	204	30	10	57	301
1979	382	27	33	81	523
					1,366

* Note differences in classification systems between this survey and the Census.
** Seven month figure following the June 1, 1976 Census date.
Source: Unpublished data available from either Statistics Canada or Canada Mortgage and Housing Corporation (CMHC). Summary data published in publication 64-002, *Housing Starts and Completions.*

Assessing Trends and Forecasting

As a quick check on the balance of housing supply and demand, the Planning Department tabulated the number of units approved in registered plans by type of dwelling. They found that over 60 percent of these approvals were for apartments, rows and doubles. This meant that, if completed units over the last three and a half years were any indication of current demand, an imbalance was developing between likely demand and planned supply. However, it was felt that this implied imbalance would be best left to market forces to correct.

Of greater importance to the Planning Department was the type and amount of demand in the future. Two approaches were used for estimating this:

- calculating average household size and applying it to population projection to obtain total dwellings needed (plus a factor to account for vacancies since household sizes are for *occupied* dwellings — A rough estimate of 3% vacancy rate is usually used).
- using a more complicated model that applies age-cohort population projections and headship rates (the number of persons in that age group who are heads of households).

Table 6.3

Population Projection for Facton* by Specified Age Groups

	1976	1981	1986
0 - 14	8,715	7,472	7,483
15 - 24	7,610	6,348	5,198
25 - 34	5,265	6,807	7,630
35 - 44	4,505	4,792	6,175
45 - 54	4,505	4,555	4,352
55 - 64	1,695	3,490	3,963
65 +	2,335	3,090	3,874
	34,630	36,554	38,675

*Source: 1976 Census and Facton's own projections (See Chapter 5. — note that the worksheets shown in table 5.3 are for females only).

The first approach was a relatively quick and simple technique. It involved dividing an estimate of household size into the total projected population estimates in table 6.3. A diminishing trend in average household size was observed in table 4.1, from 4.1 persons in 1961 to 3.3 persons in 1976. However, the Planning Department felt that, although there might still be some shrinkage, the fact that their community comprised mostly families meant that average size would not be expected to drop by much more. By reviewing the case histories of several municipalities and cities whose growth patterns had been similar to Facton's in the past but had already reached a 'maturing' stage, the Planning Department concluded that a drop in average household size to 3.0 persons in 1981 could be anticipated with a further drop to 2.8 in 1986. The resulting household projections would therefore be calculated as follows:

$1981 - 36,554 \div 3.0 = 12,185 \times 1.03$ (vacancy factor) $= 12,550$
$1986 - 38,675 \div 2.8 = 13,813 \times 1.03$ (vacancy factor) $= 14,227$

This estimate for 1981 was examined in relation to another estimate based on other information that was known at the end of 1980 and estimates for the period up to June 1981:

1976 Occupied Dwellings	10,290	(Table 6.1)
Vacant Units in 1976 Census	370	(Special Request to Statistics Canada)
Total Units Constructed June 1, 1976 to December 31, 1980	1,366	(Table 6.2)
Estimate of Construction for first 5 Months in 1981	225	(Building Permits Department)
Demolitions 1976-1980 inclusive*	-26	(Planning Department)
Conversions 1976-1980 inclusive (Same period as constructed)	134	(Planning Department)
Forecast estimate of stock as of June 1, 1981	12,359	

*Taken as equivalent of June 1, 1976 — June 1, 1981

Because this second estimate was very close to the earlier estimate, the Planning Department was reassured as to the accuracy of its forecast estimate. However, neither of these approaches provided an estimate of demand by age group — important information for estimating the housing needs of the elderly. Also, there were no guarantees that the household size assumption would hold true beyond 1981. This again emphasized to them the importance of the operating *assumptions*.

The Planning Department next used the traditional approach of applying headship rates by age groups to an existing population forecast. The 'headship rate' is that proportion of an age group who are household heads. The assumption was made that there is always only one household head per household. The 1976 Census provides headship rate information as shown in table 6.4.[1] In doing their research, the planners noted that, beginning with the 1981 Census questionnaire, use of the term "Head of Household" would be discontinued. For future studies using 1981 Census data it would be necessary to work with new terms introduced by Statistics Canada.

Table 6.4

Headship Rates, City of Facton, 1976

Age Group	Total Population (A)	Household Heads (B)	Headship Rate (B/A)
15 - 24	7,610	800	10.5%
25 - 34	5,265	2,420	46.0
35 - 44	4,505	2,405	53.4
45 - 54	4,505	2,435	54.1
55 - 64	1,695	980	57.8
65 +	2,335	1,230	55.2
	25,915	10,290	39.7

Source: 1976 Census, Microfiche SDDHHA22.

[1] See note to Table 6.5

Table 6.5

Projected Households, Headship Rate Technique*
City of Facton 1976-1986

Age Group	1976 Headship			1981 Headship			1986 Headship		
	Population (A)	Rate (B)	Households (A) x (B)	Population (A)	Rate (B)	Households (A) x (B)	Population (A)	Rate (B)	Households (A) x (B)
15 - 24	7,610	.105	800	6,348	.095	604	5,198	.090	468
25 - 34	5,265	.460	2,420	6,807	.460	3,131	7,630	.460	3,510
35 - 44	4,505	.534	2,405	4,792	.534	2,559	6,175	.534	3,297
45 - 54	4,505	.541	2,435	4,555	.541	2,464	4,352	.541	2,354
55 - 64	1,695	.578	980	3,490	.578	2,017	3,963	.578	2,291
65 +	2,335	.552	1,230	3,090	.562	1,736	3,874	.567	2,197
Total	25,915	.397	10,290	29,082	.342	12,511	31,192	.365	14,117

Source: 1976 Census
Table 6.3
Table 6.4

* The 1981 Census does not use the term "head of household". For a detailed review of the general concept of household reference person (commonly referred to, up to 1981, as "head of household") see the Statistics Canada background paper, *Household Reference Person in the Census of Canada; some alternatives and their implications*, R.M.A. Sametz with C. Pleizier 1980.

A historical examination of headship rates showed that they had all increased in the last fifteen years. However, except for the youngest age group, which showed some sign of a possible decline and the oldest, which showed a probable continuing increase, the rates now seemed to have stabilized.

The Planning Department made some small adjustments in the headship rates for ages 15 to 24 and 65 plus, as can be seen in table 6.5. This table suggested that, while total population would increase by only 11.4% over the 10 year period, total households would increase 37.2% and the number of households with the head older than 65 would increase by a staggering 78.6%.

Because the housing type by age of household head and tenure type by age of household head were also available from the 1976 Census, the planners were able to differentiate the type of housing demand in the future by dwelling type and tenure. The results of this analysis are displayed in figure 6.1.

Figure 6.1

Projected Housing Demand
Facton 1976-1986
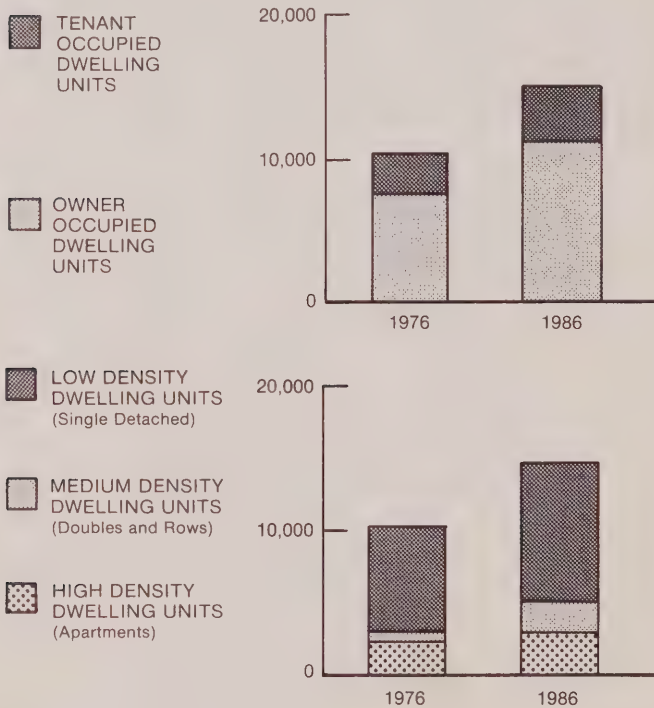
Source: Table 6.1 and Study projections

Affordability of housing was an important factor to be identified by the Planning Department in its investigation. Unfortunately, the latest available comprehensive income statistics for small areas were from the 1971 Census and the 1981 results were yet to be released. Consequently, the Planning Department looked at several different indicators in order to develop a general picture of the factors related to affordability without having to go to the very considerable effort of undertaking their own survey of incomes.

- The distribution of household income was obtained for the province from publication 13-207 *Income Distributions by Size in Canada*. This also included an estimate of the so-called 'poverty line'.
- Average house prices were obtained from the Multiple Listing Service of the Facton Real Estate Board.
- Estimates of vacancy rates were obtained from CMHC.
- Estimates of rent levels by number of bedrooms were obtained from CMHC.
- Interest rates for mortgages were obtained from CMHC and the Bank of Canada.

Recommendations

The analysis of these different indicators suggested a dramatic future growth in the numbers of elderly citizens with relatively low incomes. On the basis of this finding, Facton's Planning Department recommended that a first priority should be the provision of assisted housing for senior citizens.

After extensive discussions on the significance of various other trends and patterns identified in their Housing Needs Study, the Planning Department was able to recommend:

- assisting and encouraging the development of housing construction targets stated in terms of needs and specific types of dwellings owned or rented, and for particular groups — such as the physically handicapped
- ensuring adequacy of lot supply for various housing types
- encouraging public participation and public and private sector inputs in housing policy
- reducing costs of housing and ensuring that new units being considered are planned to fit the price range of the residents most needing them
- adopting staging programs for development
- participating in senior government housing programs
- developing maintenance and occupancy bylaws
- creating information systems to monitor development.

From projected supply and demand data produced through its *Housing Needs Study*, the Planning Department was able to establish a very well-researched development policy for Facton. As more data became available in the future, from the 1981 Census and other sources, this development policy could easily be updated by refinements and extensions to the projections already made.

Appendix 1
Selected Publications Containing Statistics For Communities and Regions

Catalogue Number of Publication

11-511 **Perspectives Canada III**
Contains selected statistical series describing the quality of life experienced by Canadians and the major social trends affecting Canadian society. Topics include population, family, health, education, income, consumption, work, leisure, crime and environment, profiles of 23 Canadian urban areas and other data.

12-566 **Guide to Sub-provincial Data** (Excluding Census Data) **1979**
This publication is an update to the *GUIDE TO URBAN DATA (Excluding Census Data), 1971,* published in June, 1979. It contains a guide to the kind of sub-provincial data — not only urban — appearing in forty three non-census publications released in 1979 by Statistics Canada.
Published data available in the CANSIM data base are denoted by the CANSIM identifier. In the case of a small number of important data, a guide to the time series is also included.

31-209 **Manufacturing Industries of Canada: Sub-provincial Areas**
Results of the annual Census of Manufactures for census metropolitan areas, census agglomerations, sub-provincial regions, census divisions and selected census subdivisions. Detailed production-related statistics are provided (value of shipments inventory, cost of materials and supplies, value added, employment etc.).

53-219 **Road Motor Vehicles: Registrations**
Registration of motor vehicles by type of census divisions and municipalities.

62-001 **The Consumer Price Index (Monthly)**
62-010 **The Consumer Price Index (Quarterly)**
Retail price movements for a range of consumer goods and services for Canada and fifteen regional CMAs.

63-224 **Market Research Handbook**
Compilation of marketing information from various Statistics Canada sources with emphasis on provincial and sub-provincial data. Includes

general economic indicators; government revenue, expenditure and employment; population characteristics; personal income and expenditure; housing and household facilities; merchandising and services data; some breakdowns by metropolitan area and census agglomeration; extensive notes and glossary of terms.

64-002 Housing Starts and Completions
Construction of new permanent dwellings in Canada showing starts, completions and units under construction, monthly figures for provinces and urban centres of 10,000 or more.

64-001 Building Permits (Monthly)

64-203 Building Permits (Annual)
Statistics on building permits issued by municipalities: number of new dwelling units by type: value of residential, commercial, governmental and institutional building construction for individual municipalities, census metropolitan areas, census agglomerations, census divisions and provinces.

71-001 The Labour Force
Presents adjusted and unadjusted estimates of labour force, employment and unemployment with unemployment and participation rates analysed by selected geographic demographic and occupational variables. Includes updates to historical series contained in 71-201, occasional special analyses and sample questionnaire.

72-002 Employment, Earnings and Hours
Industry data on industrial employment, average weekly earnings, average weekly hours, average hourly earnings for selected cities.

84-207 Principal Vital Statistics by Local Areas
The report consists of one table, entitled "General Summary of Vital Statistics for Counties, Census Division or Districts and Urban Places". The table lists births and deaths by sex for each of these areas, along with still-births, infant mortality and marriages.

85-205 Crime and Traffic Enforcement
Statistical summary of some law enforcement activities in relation to crime and traffic offences as reported by municipal police forces in urban centres of 750 population and over, the Royal Canadian Mounted Police, Ontario Provincial Police, Quebec Provincial Police, Railway and National Harbours Board Police.

Appendix 2
List of Census Tract Centres[(+)]

CMA or CA	1971 Cat. Nos.	1976 Cat. No.	Percentage of Area Geocoded in 1981
St. John's (Nfld)	95-701, 95-731	95-818	60%
Halifax (N.S.)	95-702, 95-732	95-805	68%
Saint John (N.B.)	95-703, 95-733	95-819	76%
Montreal (Que.)	95-704, 95-734	95-811	86%
Quebec (Que.)	95-705, 95-735	95-815	78%
Sherbrooke (Que.)	95-706, 95-736	95-823	74%
Trois-Rivieres (Que.)	95-707, 95-737	95-827	64%
Brantford (Ont.)	95-708, 95-738	95-800	81%
Hamilton (Ont.)	95-709, 95-739	95-806	79%
Kingston (Ont.)	95-710, 95-740	95-807	89%
Kitchener — Guelph (Ont.)	95-711, 95-741	95-808 Kitchener	100%
		95-804 Guelph	96%
London (Ont.)	95-712, 95-742	95-809	89%
St. Catharines — Niagara (Ont.)	95-713, 95-743	95-817	63%
Oshawa (Ont.)	95-714, 95-744	95-812	79%
Ottawa-Hull	95-715, 95-745	95-813	89%
Peterborough (Ont.)	95-716, 95-746	95-814	91%
Sarnia (Ont.)	95-717, 95-747	95-820	72%
Sault Ste. Marie (Ont.)	95-718, 95-748	95-822	99%
Sudbury (Ont.)	95-719, 95-749	95-824	62%
Thunder Bay (Ont.)	95-720, 95-750	95-825	94%
Toronto (Ont.)	95-721, 95-751	95-826	93%
Windsor (Ont.)	95-722, 95-752	95-830	79%
Winnipeg (Man.)	95-723, 95-753	95-831	97%
Regina (Sask.)	95-724, 95-754	95-816	99%
Saskatoon (Sask.)	95-725, 95-755	95-821	100%

Calgary (Alta.)	95-726, 95-756	95-801	100%
Edmonton (Alta.)	95-727, 95-757	95-803	83%
Vancouver (B.C.)	95-728, 95-758	95-828	92%
Victoria (B.C.)	95-729, 95-759	95-829	77%
Chicoutimi-Jonquiere (Que.)	—	95-802	92%
Moncton (N.B.)	—	95-810	—
*North Bay (Ont.)	—	—	—
*Kamloops (B.C.)	—	—	—
*Kelowna (B.C.)	—	—	—
*Prince George (B.C.)	—	—	—

(+) See page 10 for explanation of census tracts.
* These cities newly census-tracted for 1981 Census.

Appendix 3
Statistics Canada User Services

The following are some of the services which Statistics Canada offers to help users acquire and use data. Many of these are provided through the Regional Operations and Marketing Field of Statistics Canada, which is specifically charged with promoting data use and assisting users. However, this is not to suggest that users should not establish direct contact with the statisticians responsible for a particular data series, if they wish to do so. All divisions of Statistics Canada maintain close contact with users of their data and are happy to be of assistance.

General advisory services are provided by Statistics Canada because users often experience difficulty in identifying or locating the most appropriate person to help them. Also, many data users are interested in more than one type of data and either do not have the time to consult a whole string of people or prefer to discuss their problem with someone closer at hand and who has a more general perspective on the data produced and their uses.

Advisory Services

The advisory services offered by Statistics Canada to the public include statistical reference centres in eight cities across Canada and the Central Inquiries Office in Ottawa. Each of these reference centres maintains collections of Statistics Canada publications and unpublished material, plus some other government and non-government statistical publications. The centres are staffed by knowledgeable inquiries officers who each year answer over 160,000 requests for statistics or for advice on the meaning and use of data. Most inquiries are received by telephone and many are by letter or from visitors to the reference centres which are open during normal working hours. Study areas and photocopying facilities are provided.

Each regional reference centre has one or more advisory officers who are responsible for maintaining local liaison between Statistics Canada and data users in government, business, labour institutions and educational establishments. They promote the use of statistics through visits, talks and meetings including participation in conferences, seminars, workshops, displays, etc. They also assist experienced and inexperienced users with individual data problems.

Many of those services are provided on a cost recovery basis and involve a nominal charge. All services are available in both official languages.

An important part of the role of regional advisory officers is to provide valuable feedback to bureau staff in Ottawa on the statistical needs and problems of users so as to help improve the content and availability of Statistics Canada's products and services.

The following are some of the specific services provided by the advisory services regional reference centres and the Ottawa Central Inquiries Office:

- answering requests for data or for information on such things as statistical methodology or definitions. This may include providing information in advance of receipt of the publication, suggesting alternative sources of information or, if necessary, referring users to the appropriate subject matter specialists in Ottawa;
- providing advice on how data may be used to solve particular problems;
- assisting with the ordering of Statistics Canada publications;
- providing training sessions, workshops, lectures, etc., on the availability, use, etc., of statistics. These may be of a general nature or related to particular data interests;
- providing display materials for conferences, meetings, etc. Again this can be general material reflecting the full range of Statistics Canada's output, or it can be geared to a particular theme or subject;
- providing data from, or information on, CANSIM — Statistics Canada's machine readable data base system. All the regional reference centres have computer terminals which can access CANSIM data. Small, ad hoc retrievals can be performed and large requests may be channelled to the CANSIM staff in Ottawa. Users will be billed on a cost recovery basis. Regional advisory officers will provide information on CANSIM, including demonstrations to interested users;
- providing advice on the establishment and maintenance of data collections.

The Statistics Canada Library in Ottawa

This library is situated on the second floor of the R.H. Coats Building, Tunney's Pasture, Ottawa. Although its major function is to provide reference material and library services to the bureau's staff, the library also makes its resources and services available to other government departments and to the general public.

Advisory Services — Regional Reference Centres Across Canada

Ottawa
Central Inquiries,
Statistics Canada,
Lobby, R.H. Coats Building
Ottawa, Ontario
K1A 0T6
Telephone: 992-4734

St. John's
Statistics Canada,
3rd floor,
Viking Building,
Crosbie Road,
St. John's, Newfoundland
A1B 3P2
Telephone: 737-4073

Winnipeg
Statistics Canada,
Room 602,
General Post Office,
266 Graham Avenue,
Winnipeg, Manitoba,
R3C 0K4
Telephone: 949-4020

Halifax
Statistics Canada,
3rd floor,
1256 Barrington Street,
Halifax, Nova Scotia
B3J 1Y6
Telephone: 426-5331

Montreal
Statistics Canada,
7th floor,
Alexis Nihon Plaza,
1500 Atwater Avenue,
Montreal, Quebec
H3Z 1Y2
Telephone: 283-5725

Toronto
Statistics Canada,
10th floor,
25 St. Clair Avenue East,
Toronto, Ontario
M4T 1M4
Telephone: 966-6586

Regina
Statistics Canada,
530 Midtown Centre,
Regina, Saskatchewan,
S4P 2B6
Telephone: 359-5405

Edmonton
Statistics Canada,
Suite 215,
11010-101 Street,
Edmonton, Alberta
T5H 4C5
Telephone: 420-3027

Vancouver
Statistics Canada,
Main floor,
1145 Robson Street,
Vancouver, British Columbia
V6E 3W8
Telephone: 666-3695

In the Maritimes, toll-free access to the Halifax office is available by calling 1-800-565-7192. Throughout Saskatchewan, the Regina office can be reached by dialing 1(112)-800-667-3524 and in Alberta, the Edmonton office can be reached at 1-800-222-6400.

To subscribe to publications, write to:

Publication Sales and Services,
User Services Division,
Statistics Canada,
Ottawa, Ontario.
K1A 0V7

Appendix 4
Canadian Reference Libraries Receiving All Federal Government Publications, Including All Statistics Canada Publications

(There are also many other libraries holding extensive collections of Statistics Canada publications.)

Memorial University Library
St. John's, Newfoundland

Dalhousie University Library
Studley Campus
Halifax, Nova Scotia

Acadia University Library
Wolfville, Nova Scotia

Harriet Irving Library
University of New Brunswick
Fredericton, New Brunswick

Université de Moncton
Bibliotheque Champlain
Moncton, Nouveau-Brunswick

Ralph Pickard Bell Library
Mount Allison University
Sackville, New Brunswick

Planning Library
P.O. Box 2000
Charlottetown, Prince Edward Island

Bibliotheque de la Ville de Montréal
1210 Sherbrooke east
Montréal, Quebec

McGill University Library
3459 McTavish Street
Montreal, Quebec

Concordia University Libraries
Montreal, Quebec

Bibliotheques des sciences humaines
et sociales
Université de Montréal
Montréal, Québec

Bibliotheque de l'Université Laval
Cité Universitaire
Ste-Foy
Québec, Québec

Bibliotheque générale
Université de Sherbrooke
Cité Universitaire
Sherbrooke, Québec

York University Libraries
4700 Keele Street
Downsview, Ontario

University of Guelph Library
Documentation Centre
Guelph, Ontario

Hamilton Public Library
Hamilton, Ontario

Mills Memorial Library
McMaster University,
Hamilton, Ontario

Douglas Library
Queen's University
Kingston, Ontario

University of Western Ontario
Library
London, Ontario

National Library of Canada
Canadian Acquisitions Division
Government Documents
Ottawa, Ontario

University of Ottawa Central Library
165 Waller Street
Ottawa, Ontario

Laurentian University Library
Sudbury, Ontario

Metropolitan Toronto Library
789 Yonge Street
Toronto, Ontario

University of Toronto Library
Toronto, Ontario

Lakehead University Library
Thunder Bay, Ontario

Public Library
216 S. Brodie Street
Thunder Bay, Ontario

Dana Porter Arts Library
University of Waterloo
Waterloo, Ontario

Windsor Public Library
850 Ouellette Avenue
Windsor, Ontario

Elizabeth Dafoe Library
University of Manitoba
Winnipeg, Manitoba

University of Saskatchewan Library
Saskatoon, Saskatchewan

University of Calgary Library
Government Publications
Calgary, Alberta

University of Alberta Library
Edmonton, Alberta

Edmonton Public Library
Sir Winston Churchill Square
Edmonton, Alberta

Simon Fraser University Library
Burnaby, British Columbia

University of British Columbia
Library
Government Publications
Vancouver, British Columbia

Vancouver Public Library
750 Burrard Street
Vancouver, British Columbia

McPherson Library
University of Victoria
Victoria, British Columbia

Northwest Territories Government
Library
Government of Northwest Territories
Yellowknife, Northwest Territories

Note: Many legislative libraries also receive all Statistics Canada publications. However, they may not be open to the general public.

Remember

If you cannot find the figures you want, or you need help in using statistics, ask for advisory services at the nearest Statistics Canada Office.

Statistics Canada publications are available to everyone. If the information you need cannot be found in a publication, it may be available in unpublished form. For many statistics, special tabulations, more precisely tailored to your needs, can be provided at cost.

Always read the small print — the Introduction, Definitions and Notes included in statistical publications.

Make allowances for the fact that most statistics are scientific estimates and are rarely 100% precise.

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